TABLE 1-1
Air Release Data from Toxic Release Inventory Explorer Database
Remedial Investigation Report
ASARCO LLC Hayden, Arizona Plant Site

	2003			2004			2005			2006		
Facility or Chemical	**On-Site Fugitive Air (lbs)**	**On-Site Point Source Air (lbs)**	**Total Air Emissions (lbs)**	**On-Site Fugitive Air (lbs)**	**On-Site Point Source Air (lbs)**	**Total Air Emissions (lbs)**	**On-Site Fugitive Air (lbs)**	**On-Site Point Source Air (lbs)**	**Total Air Emissions (lbs)**	**On-Site Fugitive Air (lbs)**	**On-Site Point Source Air (lbs)**	**Total Air Emissions (lbs)**
Antimony Compounds	125	11	136	87	0	87	68	34	102	60	26	86
Arsenic Compounds	4,811	490	5,301	2,035	433	2,468	1,416	664	2,080	1,951	768	2,719
Barium Compounds	0	921	921	4	77	81	3	8,624	8,627	0	5,889	5,889
Cadmium Compounds	77	502	579	62	36	98	40	46	86	67	67	134
Chromium Compounds (except Chromite Ore mined in the Transvaal Region)	0	42	42	6	0	6	3	60	63	2	46	48
Cobalt Compounds	0	1	1	1	1	2	1	2	3	1	2	3
Copper Compounds	57,579	4,161	61,740	63,242	5,704	68,946	50,484	6,089	56,573	67,862	6,981	74,843
Lead Compounds	6,419	2,131	8,550	2,909	102	3,011	1,787	758	2,545	3,749	874	4,623
Manganese Compounds	0	906	906	1	0	1	1	20	21	1	10	11
Mercury Compounds	0	16	16	0	2	2	0	11	11	0	13	13
Nickel Compounds	0	4	4	5	0	5	1	40	41	4	32	36
Selenium Compounds	790	12	802	757	0	757	643	3	646	761	2	763
Silver Compounds	176	13	189	162	0	162	114	16	130	143	16	159
Sulfuric Acid (1994 and after "Acid Aerosols" only)	1,381	436,592	437,973	1,347	122,290	123,637	1,316	236,847	238,163	1,431	259,129	260,560
Vanadium (except when contained in an alloy)	0	0	0	0	0	0	0	6	6	0	4	4
Zinc Compounds	3,001	15,903	18,904	3,369	2,190	5,559	2,126	27,268	29,394	3,103	30,995	34,098
Total	74,359	461,705	536,064	73,987	130,835	204,822	58,003	280,488	338,491	79,135	304,854	383,989

Table Notes:
[1] Reference: http://www.epa.gov/triexplorer
[2] The query was for reporting years 2003, 2004, 2005, and 2006
[3] Facility Report for Arizona, Gila County, North American Industtry Classification System (NAICS) Codes: 212234 and 331411
[4] ASARCO LLC Ray Complex / Hayden Smelter and Concentrator is the only facility listed for this query

TABLE 1-2

Summary of PM_{10} Fraction Laboratory Data from 1999 to 2001

ADEQ Hayden Jail Monitoring Station

Remedial Investigation Report

ASARCO LLC Hayden, Arizona Plant Site

Analyte	Arizona Ambient Air Quality Standards[1] (µg/m^3)	EPA Region IX Preliminary Remediation Goal[2] (µg/m^3)	Number of Analyses	Number of Detections	Frequency of Detection	Percentage of Detections (%)	Number of EPA Region IX Preliminary Remediation Goal[2] Exceedances	Minimum Detected Value (µg/m^3)	Maximum Detected Value (µg/m^3)	Arithmetic Mean Value (µg/m^3)
Aluminum	--	5.1	167	167	167/167	100	0	0.0939	5.07	1.65
Antimony	--	--	167	3	3/167	2	0	0.0352	0.119	0.0266
Arsenic	--	0.00045	167	166	166/167	99	166	**0.00361**	**0.134**	**0.0331**
Barium	--	0.52	167	13	13/167	8	0	0.0854	0.248	0.0907
Bromine	--	--	167	149	149/167	89	0	0.00166	0.0154	0.0041
Cadmium	--	0.0011	167	23	23/167	14	23	**0.0146**	**0.0314**	**0.0168**
Calcium	--	--	167	167	167/167	100	0	0.102	7.57	1.67
Chlorine	--	--	167	105	105/167	63	0	0.0339	0.756	0.115
Chromium	--	0.00016	167	2	2/167	1	2	**0.00792**	**0.0121**	**0.00641**
Cobalt	--	0.00069	167	0	0/167	0	0	ND	ND	ND
Copper	--	--	167	167	167/167	100	0	0.0229	4.51	0.865
Gallium	--	--	167	2	2/167	1	0	0.00427	0.00546	0.00316
Gold	--	--	167	0	0/167	0	0	ND	ND	ND
Indium	--	--	167	0	0/167	0	0	ND	ND	ND
Iron	--	--	167	167	167/167	100	0	0.0967	4.55	1.45
Lanthanum	--	--	167	0	0/167	0	0	ND	ND	ND
Lead	1.5 [3,4,5]	--	167	167	167/167	100	0	0.00664	0.221	0.0686
Magnesium	--	--	167	165	165/167	99	0	0.0368	0.707	0.211
Manganese	--	0.051	167	165	165/167	99	2	0.00567	**0.0622**	0.0188
Mercury	--	0.31	167	3	3/167	2	0	0.00489	0.0058	0.00386
Molybdenum	--	--	167	163	163/167	98	0	0.00483	0.112	0.0189
Nickel	--	0.008	167	25	25/167	15	1	0.00207	**0.0172**	0.00347
Palladium	--	--	167	0	0/167	0	0	ND	ND	ND
Phosphorus	--	--	167	3	3/167	2	0	0.0307	0.0647	0.0232
Potassium	--	--	167	167	167/167	100	0	0.0402	1.62	0.53
Rubidium	--	--	167	158	158/167	95	0	0.00109	0.00867	0.00323
Selenium	--	--	167	164	164/167	98	0	0.00183	0.0939	0.017

TABLE 1-2
Summary of PM_{10} Fraction Laboratory Data from 1999 to 2001
ADEQ Hayden Jail Monitoring Station
Remedial Investigation Report
ASARCO LLC Hayden, Arizona Plant Site

Analyte	Arizona Ambient Air Quality Standards[1] ($\mu g/m^3$)	EPA Region IX Preliminary Remediation Goal[2] ($\mu g/m^3$)	Number of Analyses	Number of Detections	Frequency of Detection	Percentage of Detections (%)	Number of EPA Region IX Preliminary Remediation Goal[2] Exceedances	Minimum Detected Value ($\mu g/m^3$)	Maximum Detected Value ($\mu g/m^3$)	Arithmetic Mean Value ($\mu g/m^3$)
Silicon	--	--	167	167	167/167	100	0	0.339	16.7	5.06
Silver	--	--	167	10	10/167	6	0	0.0175	0.0418	0.0154
Sodium	--	--	167	72	72/167	43	0	0.0591	0.409	0.157
Strontium	--	--	167	166	166/167	99	0	0.00189	0.0226	0.00786
Sulfur	--	--	167	167	167/167	100	0	0.156	2.74	1.13
Thallium	--	--	167	0	0/167	0	0	ND	ND	ND
Tin	--	--	167	9	9/167	5	0	0.0273	0.0372	0.0227
Titanium	--	31	167	164	164/167	98	0	0.0467	0.316	0.104
Uranium	--	--	167	0	0/167	0	0	ND	ND	ND
Vanadium	--	--	167	1	1/167	1	0	0.0255	0.0255	0.0178
Yttrium	--	--	167	51	51/167	31	0	0.00222	0.00513	0.00247
Zinc	--	--	167	167	167/167	100	0	0.00547	0.388	0.0743
Zirconium	--	--	167	145	145/167	87	0	0.00194	0.0092	0.00378

Table Notes:

[1] Arizona Department of Environmental Quality Ambient Air Quality Standards, Title 18 Chapter 2 Article 2, December 2007
[2] EPA Region IX Preliminary Remediation Goals, Ambient Air, October 2004
[3] The averaging time for the criteria is the quarterly average.
[4] Only the PM_{10} fraction is being measured not the total suspended particulates.
[5] On May 20, 2008, EPA proposed to revise the National Ambient Air Quality (NAAQS) for lead to within the range of 0.1-0.3 mg/m^3.
[6] Source of Data: Sandra Wardwell, Data Management Team, Arizona Department of Environmental Quality, "ADEQ XRF Data Hayden PM10 Dichot Filters 1991-2001", E-mail to Prabhat Bhargava, October 13, 2005.
[7] Bold values with bold outline indicate the result exceeds one or more of the comparison criteria.
[8] -- = Not established
[9] % = Percent
[10] ND = Non-detect
[11] $\mu g/m^3$ = Micrograms per cubic meter

TABLE 1-3
Chemicals of Concern
Remedial Investigation Report
ASARCO LLC Hayden, Arizona Plant Site

Chemicals of Concern[1]
Metals:
Arsenic
Copper
Lead
Cadmium
Chromium
Mercury
Sulfate
Sulfur Dioxide (SO_2) in Ambient Air
Particulates in Ambient Air (PM_{10})
Chemicals of Potential Concern[2]
Metals:
Aluminum
Antimony
Barium
Beryllium
Boron
Cobalt
Manganese
Molybdenum
Nickel
Silver
Selenium
Thallium
Zinc
Cyanide
Radionuclides:
Radium 226
Radium 228
Uranium
Thorium
Gross Alpha
Gross Beta
Volatile Organic Compounds
Semi-volatile Organic Compounds

Table Notes:
[1] Chemicals of Concern list is based on historic data and previous studies, and includes those that exceeded state or federal regulatory criteria.
[2] Chemicals of Potential Concern list includes those that may be present at elevated levels because of their possible association with ore processing and smelting activities.
PM_{10} - Particulate Matter

TABLE 2-1
Demographics Information for Study Area
Remedial Investigation Report
ASARCO LLC Hayden, Arizona Plant Site

Demographic Detail	Hayden	Winkelman
Population:[1]		
Total area	1.3 mi^2	0.7 mi^2
Population	892[1] (840[3])	443[1] (435[3])
Number of households	288	160
Population density	707.1/mi^2	612.3/mi^2
Age:[1]		
19 and under	35.90%	33.60%
20-34	17.10%	13.50%
35-44	9.80%	13.30%
45-54	13.80%	13.30%
55-64	9.40%	11.70%
65 or older	14.10%	14.40%
Median age	32.1	36.6
Racial Makeup:[1]		
One Race	94.70%	98.40%
White	57.00%	62.10%
Black or African American	0.40%	0.20%
Native American	1.70%	0.00%
Pacific Islander	0.60%	0.00%
Other	35.10%	36.10%
Two or more races	5.30%	1.60%
Origin:[1 2]		
Latino or Hispanic (of any race)	84.50%	74.70%
Not Hispanic or Latino	15.50%	25.30%
Income:[1]		
Median income	$24,293	$25,455
Per capita income	$9,797	$10,506
Population below poverty line	27.30%	27.20%
Labor Force:[3]		
Civilian labor force	294	167
Unemployed	25	7
Unemployment rate	8.50%	4.20%
Growth Indicators:[4]		
New building permits	0	0
Taxable sales ($)	25.7 million	2 million
Net assessed value ($)	3.6 million	$775,510

Table Notes:

[1] U.S. Census Bureau, Census 2000, Table DP-1. Profile of General Demographic Characteristics: 2000

[2] Per the U.S. Census Bureau, origin is defined as "the heritage, nationality group, lineage, or country of birth of the person or the person's parents or ancestors before their arrival in the United States. People who identify their origin as Spanish, Hispanic, or Latino may be of any race."

[3] Arizona Department of Commerce Community Profile 2006 statistics; source Arizona Department of Economic Security

[4] Arizona Department of Commerce Community Profile 2006 statistics; sources Arizona State University, Arizona Department of Revenue, Arizona Tax Research Foundation. NOTE: New building data unavailable for this area.

[5] Group percentages may add to more or less than the total population due to numerical rounding in the U.S. Census Bureau report.

TABLE 2-2
Special Status Species in the Project Area[1]
Remedial Investigation Report
ASARCO LLC Hayden, Arizona Plant Site

Taxon[2]	Scientific Name	Common Name	Endangered Species Act	Bureau of Land Management	United States Forest Service	Arizona Game and Fish Department
Plant	*Eriogonum capillare*	San Carlos Wild-buckwheat	SC			SR
Plant	*Euphorbia gracillima*	Mexican Broomspurge			S	
Plant	*Lilaeopsis schaffneriana var. recurva*	Huachuca Water Umbel	LE			HS
Plant	*Penstemon superbus*	Superb Beardtongue			S	
Invertebrate	*Cicindela oregona maricopa*	Maricopa Tiger Beetle	SC	S	S	
Fish	*Agosia chrysogaster chrysogaster*	Gila Longfin Dace	SC	S		
Fish	*Catostomus clarki*	Desert Sucker	SC	S		
Fish	*Catostomus insignis*	Sonora Sucker	SC	S		
Reptile	*Gopherus agassizii (Sonoran Population)*	Sonoran Desert Tortoise	SC			WSC
Bird	*Asturina nitida maxima*	Northern Gray Hawk	SC		S	WSC
Bird	*Buteogallus anthracinus*	Common Black-Hawk			S	WSC
Bird	*Coccyzus americanus occidentalis*	Western Yellow-billed Cuckoo	C		S	WSC
Bird	*Empidonax traillii extimus*	Southwestern Willow Flycatcher	LE		S	WSC
Bird	*Haliaeetus leucocephalus*	Bald Eagle	LT, PDL		S	WSC
Bird	*Ictinia mississippiensis*	Mississippi Kite				WSC
Bird	*Tyrannus melancholicus*	Tropical Kingbird				WSC
Mammal		Bat Colony				
Mammal	*Corynorhinus townsendii pallescens*	Pale Townsend's Big-eared Bat	SC			

[1] Project Area within designated critical habitat for southwestern willow flycatcher. AGFD #M06-04210824. Proposed Remedial Investigation.
[2] List from Arizona Game and Fish Department , Heritage Management System, April 24, 2006. Project Evaluation Program.
[3] C = Candidate Species
[4] HS = Highly Safeguarded
[5] LE = Listed Endangered
[6] LT = Listed Threatened
[7] PDL = Proposed for Delisting
[8] S = Sensitive
[9] SC = Species of Concern
[10] SR = Salvage Restricted
[11] WSC = Wildlife of Special Concern in Arizona

TABLE 3-1
Analytical Method Variations
Remedial Investigation Report
ASARCO LLC Hayden, Arizona Plant Site

Media	Analyte	Sampling Episode	QAPP Method	Actual Method
Groundwater	Metals	Winter 2006	CLP	EPA 200 series
	Cyanide	Summer 2006	CLP	EPA 335.4
	Gross Alpha	Winter 2006	EPA 900	EPA 60000-02
		Summer 2006	EPA 900	EPA 60000-07
	Gross Beta	Winter 2006	EPA 900	EPA 60000-02
	Radium 228	Winter 2006	EPA 904.1	EPA 903.1
		Summer 2006	EPA 904.1	EPA 903.1
Surface Water	Ammonia	Winter 2006	EPA 350	EPA 351.2
		Summer 2006	EPA 350	EPA 351.2
Sediment	TOC	Winter 2006	ASTM D4839	EPA 440.1
		Summer 2006	ASTM D4839	EPA 440.1
Surficial Soil	TOC	Phase I	ASTM D4839	EPA 440.1
		Phase II	ASTM D4839	EPA 440.1
Indoor and Attic Dust	Metals	All	CLP	EPA 6010B/7473
	Cyanide		CLP	Not Sampled
	Chromium VI		EPA 7196	Not Sampled

TABLE 3-2
Summary of Tier 3 Sample Validation
Remedial Investigation Report
ASARCO LLC Hayden, Arizona Plant Site

	General Parameters			Inorganics			PM_{10}			Radiological			Semi-volatile Organic Compounds			Total Petroleum Hydrocarbons			Volatile Organic Compounds		
Media Group	**Number of Samples Collected**	**Number of Samples with Tier 3 Validated**	**Percent of Samples with Tier 3 Validated**	**Number of Samples Collected**	**Number of Samples with Tier 3 Validated**	**Percent of Samples with Tier 3 Validated**	**Number of Samples Collected**	**Number of Samples with Tier 3 Validated**	**Percent of Samples with Tier 3 Validated**	**Number of Samples Collected**	**Number of Samples with Tier 3 Validated**	**Percent of Samples with Tier 3 Validated**	**Number of Samples Collected**	**Number of Samples with Tier 3 Validated**	**Percent of Samples with Tier 3 Validated**	**Number of Samples Collected**	**Number of Samples with Tier 3 Validated**	**Percent of Samples with Tier 3 Validated**	**Number of Samples Collected**	**Number of Samples with Tier 3 Validated**	**Percent of Samples with Tier 3 Validated**
Air Monitoring	0	NA	NA	127	18	14.2	128	18	14.1	0	NA	NA	0	NA	NA	0	NA	NA	0	NA	NA
Dust	3	0	0.0	37	20	54.1	0	NA	NA	0	NA	NA	0	NA	NA	0	NA	NA	0	NA	NA
Groundwater	66	0	0.0	102	0	0.0	0	NA	NA	67	0	0.0	21	0	0.0	7	0	0.0	29	6	20.7
Riparian	37	0	0.0	37	0	0.0	0	NA	NA	0	NA	NA	0	NA	NA	0	NA	NA	0	NA	NA
Sediment	30	0	0.0	30	30	100.0	0	NA	NA	0	NA	NA	0	NA	NA	0	NA	NA	0	NA	NA
Soil	201	0	0.0	1,815	220	12.1	0	NA	NA	0	NA	NA	0	NA	NA	0	NA	NA	0	NA	NA
Surface Water	30	0	0.0	60	30	50.0	0	NA	NA	0	NA	NA	0	NA	NA	0	NA	NA	0	NA	NA
Total:	**367**	**0**	**0.0**	**2,208**	**318**	**14.4**	**128**	**18**	**14.1**	**67**	**0**	**0.0**	**21**	**0**	**0.0**	**7**	**0**	**0.0**	**29**	**6**	**20.7**

Table Notes:
[1] Tier 3 validation will not be performed for general parameters - pH, % solids, and total organic carbon (TOC); this is a deviation from the QAPP which states that all parameters will have Tier 3 validation.
[2] IDW samples were not subject to Tier 3 validation.
[3] NA = Not applicable

TABLE 3-3
Summary of Rejected Data
Remedial Investigation Report
ASARCO LLC Hayden, Arizona Plant Site

Sampling Event	Sample Delivery Group	Location ID	Sample ID	Sample Date	Sample Type	Analysis Method	Parameter	Validation Reason Code[1]
Air Monitoring	07-009	Hayden	MY-102806	10/28/2006	REG	XRF	Aluminum	M2
Air Monitoring	07-009	Hayden	MY-102806	10/28/2006	REG	XRF	Antimony	M2
Air Monitoring	07-009	Hayden	MY-102806	10/28/2006	REG	XRF	Arsenic	M2
Air Monitoring	07-009	Hayden	MY-102806	10/28/2006	REG	XRF	Barium	M2
Air Monitoring	07-009	Hayden	MY-102806	10/28/2006	REG	XRF	Bromine	M2
Air Monitoring	07-009	Hayden	MY-102806	10/28/2006	REG	XRF	Cadmium	M2
Air Monitoring	07-009	Hayden	MY-102806	10/28/2006	REG	XRF	Calcium	M2
Air Monitoring	07-009	Hayden	MY-102806	10/28/2006	REG	XRF	Chlorine	M2
Air Monitoring	07-009	Hayden	MY-102806	10/28/2006	REG	XRF	Chromium	M2
Air Monitoring	07-009	Hayden	MY-102806	10/28/2006	REG	XRF	Cobalt	M2
Air Monitoring	07-009	Hayden	MY-102806	10/28/2006	REG	XRF	Copper	M2
Air Monitoring	07-009	Hayden	MY-102806	10/28/2006	REG	XRF	Gallium	M2
Air Monitoring	07-009	Hayden	MY-102806	10/28/2006	REG	XRF	Germanium	M2
Air Monitoring	07-009	Hayden	MY-102806	10/28/2006	REG	XRF	Indium	M2
Air Monitoring	07-009	Hayden	MY-102806	10/28/2006	REG	XRF	Iron	M2
Air Monitoring	07-009	Hayden	MY-102806	10/28/2006	REG	XRF	Lanthanum	M2
Air Monitoring	07-009	Hayden	MY-102806	10/28/2006	REG	XRF	Lead	M2
Air Monitoring	07-009	Hayden	MY-102806	10/28/2006	REG	XRF	Magnesium	M2
Air Monitoring	07-009	Hayden	MY-102806	10/28/2006	REG	XRF	Manganese	M2
Air Monitoring	07-009	Hayden	MY-102806	10/28/2006	REG	XRF	Mercury	M2
Air Monitoring	07-009	Hayden	MY-102806	10/28/2006	REG	XRF	Molybdenum	M2
Air Monitoring	07-009	Hayden	MY-102806	10/28/2006	REG	XRF	Nickel	M2
Air Monitoring	07-009	Hayden	MY-102806	10/28/2006	REG	XRF	Palladium	M2
Air Monitoring	07-009	Hayden	MY-102806	10/28/2006	REG	XRF	Phosphorus	M2
Air Monitoring	07-009	Hayden	MY-102806	10/28/2006	REG	XRF	PM_{10}	M2
Air Monitoring	07-009	Hayden	MY-102806	10/28/2006	REG	XRF	Potassium	M2
Air Monitoring	07-009	Hayden	MY-102806	10/28/2006	REG	XRF	Rubidium	M2
Air Monitoring	07-009	Hayden	MY-102806	10/28/2006	REG	XRF	Selenium	M2
Air Monitoring	07-009	Hayden	MY-102806	10/28/2006	REG	XRF	Silicon	M2
Air Monitoring	07-009	Hayden	MY-102806	10/28/2006	REG	XRF	Silver	M2
Air Monitoring	07-009	Hayden	MY-102806	10/28/2006	REG	XRF	Sodium	M2
Air Monitoring	07-009	Hayden	MY-102806	10/28/2006	REG	XRF	Strontium	M2

TABLE 3-3
Summary of Rejected Data
Remedial Investigation Report
ASARCO LLC Hayden, Arizona Plant Site

Sampling Event	Sample Delivery Group	Location ID	Sample ID	Sample Date	Sample Type	Analysis Method	Parameter	Validation Reason Code[1]
Air Monitoring	07-009	Hayden	MY-102806	10/28/2006	REG	XRF	Sulfur	M2
Air Monitoring	07-009	Hayden	MY-102806	10/28/2006	REG	XRF	Tin	M2
Air Monitoring	07-009	Hayden	MY-102806	10/28/2006	REG	XRF	Titanium	M2
Air Monitoring	07-009	Hayden	MY-102806	10/28/2006	REG	XRF	Vanadium	M2
Air Monitoring	07-009	Hayden	MY-102806	10/28/2006	REG	XRF	Yttrium	M2
Air Monitoring	07-009	Hayden	MY-102806	10/28/2006	REG	XRF	Zinc	M2
Air Monitoring	07-009	Hayden	MY-102806	10/28/2006	REG	XRF	Zirconium	M2
Air Monitoring	07-093	Hayden	MY-030907	3/9/2007	REG	XRF	Aluminum	M2
Air Monitoring	07-093	Hayden	MY-030907	3/9/2007	REG	XRF	Antimony	M2
Air Monitoring	07-093	Hayden	MY-030907	3/9/2007	REG	XRF	Arsenic	M2
Air Monitoring	07-093	Hayden	MY-030907	3/9/2007	REG	XRF	Barium	M2
Air Monitoring	07-093	Hayden	MY-030907	3/9/2007	REG	XRF	Bromine	M2
Air Monitoring	07-093	Hayden	MY-030907	3/9/2007	REG	XRF	Cadmium	M2
Air Monitoring	07-093	Hayden	MY-030907	3/9/2007	REG	XRF	Calcium	M2
Air Monitoring	07-093	Hayden	MY-030907	3/9/2007	REG	XRF	Chlorine	M2
Air Monitoring	07-093	Hayden	MY-030907	3/9/2007	REG	XRF	Chromium	M2
Air Monitoring	07-093	Hayden	MY-030907	3/9/2007	REG	XRF	Cobalt	M2
Air Monitoring	07-093	Hayden	MY-030907	3/9/2007	REG	XRF	Copper	M2
Air Monitoring	07-093	Hayden	MY-030907	3/9/2007	REG	XRF	Gallium	M2
Air Monitoring	07-093	Hayden	MY-030907	3/9/2007	REG	XRF	Germanium	M2
Air Monitoring	07-093	Hayden	MY-030907	3/9/2007	REG	XRF	Indium	M2
Air Monitoring	07-093	Hayden	MY-030907	3/9/2007	REG	XRF	Iron	M2
Air Monitoring	07-093	Hayden	MY-030907	3/9/2007	REG	XRF	Lanthanum	M2
Air Monitoring	07-093	Hayden	MY-030907	3/9/2007	REG	XRF	Lead	M2
Air Monitoring	07-093	Hayden	MY-030907	3/9/2007	REG	XRF	Magnesium	M2
Air Monitoring	07-093	Hayden	MY-030907	3/9/2007	REG	XRF	Manganese	M2
Air Monitoring	07-093	Hayden	MY-030907	3/9/2007	REG	XRF	Mercury	M2
Air Monitoring	07-093	Hayden	MY-030907	3/9/2007	REG	XRF	Molybdenum	M2
Air Monitoring	07-093	Hayden	MY-030907	3/9/2007	REG	XRF	Nickel	M2
Air Monitoring	07-093	Hayden	MY-030907	3/9/2007	REG	XRF	Palladium	M2
Air Monitoring	07-093	Hayden	MY-030907	3/9/2007	REG	XRF	Phosphorus	M2
Air Monitoring	07-093	Hayden	MY-030907	3/9/2007	REG	XRF	PM_{10}	M2

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Summary of Rejected Data
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Sampling Event	Sample Delivery Group	Location ID	Sample ID	Sample Date	Sample Type	Analysis Method	Parameter	Validation Reason Code[1]
Air Monitoring	07-093	Hayden	MY-030907	3/9/2007	REG	XRF	Potassium	M2
Air Monitoring	07-093	Hayden	MY-030907	3/9/2007	REG	XRF	Rubidium	M2
Air Monitoring	07-093	Hayden	MY-030907	3/9/2007	REG	XRF	Selenium	M2
Air Monitoring	07-093	Hayden	MY-030907	3/9/2007	REG	XRF	Silicon	M2
Air Monitoring	07-093	Hayden	MY-030907	3/9/2007	REG	XRF	Silver	M2
Air Monitoring	07-093	Hayden	MY-030907	3/9/2007	REG	XRF	Sodium	M2
Air Monitoring	07-093	Hayden	MY-030907	3/9/2007	REG	XRF	Strontium	M2
Air Monitoring	07-093	Hayden	MY-030907	3/9/2007	REG	XRF	Sulfur	M2
Air Monitoring	07-093	Hayden	MY-030907	3/9/2007	REG	XRF	Tin	M2
Air Monitoring	07-093	Hayden	MY-030907	3/9/2007	REG	XRF	Titanium	M2
Air Monitoring	07-093	Hayden	MY-030907	3/9/2007	REG	XRF	Vanadium	M2
Air Monitoring	07-093	Hayden	MY-030907	3/9/2007	REG	XRF	Yttrium	M2
Air Monitoring	07-093	Hayden	MY-030907	3/9/2007	REG	XRF	Zinc	M2
Air Monitoring	07-093	Hayden	MY-030907	3/9/2007	REG	XRF	Zirconium	M2
Air Monitoring	07-161	Winkelman	HS-050207	5/2/2007	REG	XRF	Aluminum	M2
Air Monitoring	07-161	Winkelman	HS-050207	5/2/2007	REG	XRF	Antimony	M2
Air Monitoring	07-161	Winkelman	HS-050207	5/2/2007	REG	XRF	Arsenic	M2
Air Monitoring	07-161	Winkelman	HS-050207	5/2/2007	REG	XRF	Barium	M2
Air Monitoring	07-161	Winkelman	HS-050207	5/2/2007	REG	XRF	Bromine	M2
Air Monitoring	07-161	Winkelman	HS-050207	5/2/2007	REG	XRF	Cadmium	M2
Air Monitoring	07-161	Winkelman	HS-050207	5/2/2007	REG	XRF	Calcium	M2
Air Monitoring	07-161	Winkelman	HS-050207	5/2/2007	REG	XRF	Chlorine	M2
Air Monitoring	07-161	Winkelman	HS-050207	5/2/2007	REG	XRF	Chromium	M2
Air Monitoring	07-161	Winkelman	HS-050207	5/2/2007	REG	XRF	Cobalt	M2
Air Monitoring	07-161	Winkelman	HS-050207	5/2/2007	REG	XRF	Copper	M2
Air Monitoring	07-161	Winkelman	HS-050207	5/2/2007	REG	XRF	Gallium	M2
Air Monitoring	07-161	Winkelman	HS-050207	5/2/2007	REG	XRF	Germanium	M2
Air Monitoring	07-161	Winkelman	HS-050207	5/2/2007	REG	XRF	Indium	M2
Air Monitoring	07-161	Winkelman	HS-050207	5/2/2007	REG	XRF	Iron	M2
Air Monitoring	07-161	Winkelman	HS-050207	5/2/2007	REG	XRF	Lanthanum	M2
Air Monitoring	07-161	Winkelman	HS-050207	5/2/2007	REG	XRF	Lead	M2
Air Monitoring	07-161	Winkelman	HS-050207	5/2/2007	REG	XRF	Magnesium	M2

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Sampling Event	Sample Delivery Group	Location ID	Sample ID	Sample Date	Sample Type	Analysis Method	Parameter	Validation Reason Code[1]
Air Monitoring	07-161	Winkelman	HS-050207	5/2/2007	REG	XRF	Manganese	M2
Air Monitoring	07-161	Winkelman	HS-050207	5/2/2007	REG	XRF	Mercury	M2
Air Monitoring	07-161	Winkelman	HS-050207	5/2/2007	REG	XRF	Molybdenum	M2
Air Monitoring	07-161	Winkelman	HS-050207	5/2/2007	REG	XRF	Nickel	M2
Air Monitoring	07-161	Winkelman	HS-050207	5/2/2007	REG	XRF	Palladium	M2
Air Monitoring	07-161	Winkelman	HS-050207	5/2/2007	REG	XRF	Phosphorus	M2
Air Monitoring	07-161	Winkelman	HS-050207	5/2/2007	REG	XRF	PM_{10}	M2
Air Monitoring	07-161	Winkelman	HS-050207	5/2/2007	REG	XRF	Potassium	M2
Air Monitoring	07-161	Winkelman	HS-050207	5/2/2007	REG	XRF	Rubidium	M2
Air Monitoring	07-161	Winkelman	HS-050207	5/2/2007	REG	XRF	Selenium	M2
Air Monitoring	07-161	Winkelman	HS-050207	5/2/2007	REG	XRF	Silicon	M2
Air Monitoring	07-161	Winkelman	HS-050207	5/2/2007	REG	XRF	Silver	M2
Air Monitoring	07-161	Winkelman	HS-050207	5/2/2007	REG	XRF	Sodium	M2
Air Monitoring	07-161	Winkelman	HS-050207	5/2/2007	REG	XRF	Strontium	M2
Air Monitoring	07-161	Winkelman	HS-050207	5/2/2007	REG	XRF	Sulfur	M2
Air Monitoring	07-161	Winkelman	HS-050207	5/2/2007	REG	XRF	Tin	M2
Air Monitoring	07-161	Winkelman	HS-050207	5/2/2007	REG	XRF	Titanium	M2
Air Monitoring	07-161	Winkelman	HS-050207	5/2/2007	REG	XRF	Vanadium	M2
Air Monitoring	07-161	Winkelman	HS-050207	5/2/2007	REG	XRF	Yttrium	M2
Air Monitoring	07-161	Winkelman	HS-050207	5/2/2007	REG	XRF	Zinc	M2
Air Monitoring	07-161	Winkelman	HS-050207	5/2/2007	REG	XRF	Zirconium	M2
Air Monitoring	07-161	Winkelman	HS-051407	5/14/2007	REG	XRF	Copper	M3
Air Monitoring	07-181	Hayden	MY-050207	5/2/2007	REG	XRF	Aluminum	M2
Air Monitoring	07-181	Hayden	MY-050207	5/2/2007	REG	XRF	Antimony	M2
Air Monitoring	07-181	Hayden	MY-050207	5/2/2007	REG	XRF	Arsenic	M2
Air Monitoring	07-181	Hayden	MY-050207	5/2/2007	REG	XRF	Barium	M2
Air Monitoring	07-181	Hayden	MY-050207	5/2/2007	REG	XRF	Bromine	M2
Air Monitoring	07-181	Hayden	MY-050207	5/2/2007	REG	XRF	Cadmium	M2
Air Monitoring	07-181	Hayden	MY-050207	5/2/2007	REG	XRF	Calcium	M2
Air Monitoring	07-181	Hayden	MY-050207	5/2/2007	REG	XRF	Chlorine	M2
Air Monitoring	07-181	Hayden	MY-050207	5/2/2007	REG	XRF	Chromium	M2
Air Monitoring	07-181	Hayden	MY-050207	5/2/2007	REG	XRF	Cobalt	M2

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Sampling Event	Sample Delivery Group	Location ID	Sample ID	Sample Date	Sample Type	Analysis Method	Parameter	Validation Reason Code[1]
Air Monitoring	07-181	Hayden	MY-050207	5/2/2007	REG	XRF	Copper	M2
Air Monitoring	07-181	Hayden	MY-050207	5/2/2007	REG	XRF	Gallium	M2
Air Monitoring	07-181	Hayden	MY-050207	5/2/2007	REG	XRF	Germanium	M2
Air Monitoring	07-181	Hayden	MY-050207	5/2/2007	REG	XRF	Indium	M2
Air Monitoring	07-181	Hayden	MY-050207	5/2/2007	REG	XRF	Iron	M2
Air Monitoring	07-181	Hayden	MY-050207	5/2/2007	REG	XRF	Lanthanum	M2
Air Monitoring	07-181	Hayden	MY-050207	5/2/2007	REG	XRF	Lead	M2
Air Monitoring	07-181	Hayden	MY-050207	5/2/2007	REG	XRF	Magnesium	M2
Air Monitoring	07-181	Hayden	MY-050207	5/2/2007	REG	XRF	Manganese	M2
Air Monitoring	07-181	Hayden	MY-050207	5/2/2007	REG	XRF	Mercury	M2
Air Monitoring	07-181	Hayden	MY-050207	5/2/2007	REG	XRF	Molybdenum	M2
Air Monitoring	07-181	Hayden	MY-050207	5/2/2007	REG	XRF	Nickel	M2
Air Monitoring	07-181	Hayden	MY-050207	5/2/2007	REG	XRF	Palladium	M2
Air Monitoring	07-181	Hayden	MY-050207	5/2/2007	REG	XRF	Phosphorus	M2
Air Monitoring	07-181	Hayden	MY-050207	5/2/2007	REG	XRF	PM_{10}	M2
Air Monitoring	07-181	Hayden	MY-050207	5/2/2007	REG	XRF	Potassium	M2
Air Monitoring	07-181	Hayden	MY-050207	5/2/2007	REG	XRF	Rubidium	M2
Air Monitoring	07-181	Hayden	MY-050207	5/2/2007	REG	XRF	Selenium	M2
Air Monitoring	07-181	Hayden	MY-050207	5/2/2007	REG	XRF	Silicon	M2
Air Monitoring	07-181	Hayden	MY-050207	5/2/2007	REG	XRF	Silver	M2
Air Monitoring	07-181	Hayden	MY-050207	5/2/2007	REG	XRF	Sodium	M2
Air Monitoring	07-181	Hayden	MY-050207	5/2/2007	REG	XRF	Strontium	M2
Air Monitoring	07-181	Hayden	MY-050207	5/2/2007	REG	XRF	Sulfur	M2
Air Monitoring	07-181	Hayden	MY-050207	5/2/2007	REG	XRF	Tin	M2
Air Monitoring	07-181	Hayden	MY-050207	5/2/2007	REG	XRF	Titanium	M2
Air Monitoring	07-181	Hayden	MY-050207	5/2/2007	REG	XRF	Vanadium	M2
Air Monitoring	07-181	Hayden	MY-050207	5/2/2007	REG	XRF	Yttrium	M2
Air Monitoring	07-181	Hayden	MY-050207	5/2/2007	REG	XRF	Zinc	M2
Air Monitoring	07-181	Hayden	MY-050207	5/2/2007	REG	XRF	Zirconium	M2
Air Monitoring	07-265	Hayden	MY-070707	7/7/2007	REG	XRF	Aluminum	M2
Air Monitoring	07-265	Hayden	MY-070707	7/7/2007	REG	XRF	Antimony	M2
Air Monitoring	07-265	Hayden	MY-070707	7/7/2007	REG	XRF	Arsenic	M2

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Sampling Event	Sample Delivery Group	Location ID	Sample ID	Sample Date	Sample Type	Analysis Method	Parameter	Validation Reason Code[1]
Air Monitoring	07-265	Hayden	MY-070707	7/7/2007	REG	XRF	Barium	M2
Air Monitoring	07-265	Hayden	MY-070707	7/7/2007	REG	XRF	Bismuth	M2
Air Monitoring	07-265	Hayden	MY-070707	7/7/2007	REG	XRF	Bromine	M2
Air Monitoring	07-265	Hayden	MY-070707	7/7/2007	REG	XRF	Cadmium	M2
Air Monitoring	07-265	Hayden	MY-070707	7/7/2007	REG	XRF	Calcium	M2
Air Monitoring	07-265	Hayden	MY-070707	7/7/2007	REG	XRF	Chlorine	M2
Air Monitoring	07-265	Hayden	MY-070707	7/7/2007	REG	XRF	Chromium	M2
Air Monitoring	07-265	Hayden	MY-070707	7/7/2007	REG	XRF	Cobalt	M2
Air Monitoring	07-265	Hayden	MY-070707	7/7/2007	REG	XRF	Copper	M2
Air Monitoring	07-265	Hayden	MY-070707	7/7/2007	REG	XRF	Gallium	M2
Air Monitoring	07-265	Hayden	MY-070707	7/7/2007	REG	XRF	Germanium	M2
Air Monitoring	07-265	Hayden	MY-070707	7/7/2007	REG	XRF	Indium	M2
Air Monitoring	07-265	Hayden	MY-070707	7/7/2007	REG	XRF	Iron	M2
Air Monitoring	07-265	Hayden	MY-070707	7/7/2007	REG	XRF	Lanthanum	M2
Air Monitoring	07-265	Hayden	MY-070707	7/7/2007	REG	XRF	Lead	M2
Air Monitoring	07-265	Hayden	MY-070707	7/7/2007	REG	XRF	Magnesium	M2
Air Monitoring	07-265	Hayden	MY-070707	7/7/2007	REG	XRF	Manganese	M2
Air Monitoring	07-265	Hayden	MY-070707	7/7/2007	REG	XRF	Mercury	M2
Air Monitoring	07-265	Hayden	MY-070707	7/7/2007	REG	XRF	Molybdenum	M2
Air Monitoring	07-265	Hayden	MY-070707	7/7/2007	REG	XRF	Nickel	M2
Air Monitoring	07-265	Hayden	MY-070707	7/7/2007	REG	XRF	Palladium	M2
Air Monitoring	07-265	Hayden	MY-070707	7/7/2007	REG	XRF	Phosphorus	M2
Air Monitoring	07-265	Hayden	MY-070707	7/7/2007	REG	XRF	PM_{10}	M2
Air Monitoring	07-265	Hayden	MY-070707	7/7/2007	REG	XRF	Potassium	M2
Air Monitoring	07-265	Hayden	MY-070707	7/7/2007	REG	XRF	Rubidium	M2
Air Monitoring	07-265	Hayden	MY-070707	7/7/2007	REG	XRF	Selenium	M2
Air Monitoring	07-265	Hayden	MY-070707	7/7/2007	REG	XRF	Silicon	M2
Air Monitoring	07-265	Hayden	MY-070707	7/7/2007	REG	XRF	Silver	M2
Air Monitoring	07-265	Hayden	MY-070707	7/7/2007	REG	XRF	Sodium	M2
Air Monitoring	07-265	Hayden	MY-070707	7/7/2007	REG	XRF	Strontium	M2
Air Monitoring	07-265	Hayden	MY-070707	7/7/2007	REG	XRF	Sulfur	M2
Air Monitoring	07-265	Hayden	MY-070707	7/7/2007	REG	XRF	Tin	M2

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Sampling Event	Sample Delivery Group	Location ID	Sample ID	Sample Date	Sample Type	Analysis Method	Parameter	Validation Reason Code[1]
Air Monitoring	07-265	Hayden	MY-070707	7/7/2007	REG	XRF	Titanium	M2
Air Monitoring	07-265	Hayden	MY-070707	7/7/2007	REG	XRF	Vanadium	M2
Air Monitoring	07-265	Hayden	MY-070707	7/7/2007	REG	XRF	Yttrium	M2
Air Monitoring	07-265	Hayden	MY-070707	7/7/2007	REG	XRF	Zinc	M2
Air Monitoring	07-265	Hayden	MY-070707	7/7/2007	REG	XRF	Zirconium	M2
Air Monitoring	07-265	Winkelman	HS-070707	7/7/2007	REG	XRF	Zinc	M3
Air Monitoring	07-377	Hayden	MY-092907	9/29/2007	REG	XRF	Manganese	M3
Air Monitoring	07-377	Hayden	MY-100507	10/5/2007	REG	XRF	Manganese	M3
Air Monitoring	07-377	Hayden	MY-101107	10/11/2007	REG	XRF	Manganese	M3
Groundwater (Winter)	Y2ES5	EQP	Y2ET4	3/3/2006	EB	CSVOL	2,4-Dinitrophenol	C2
Groundwater (Winter)	Y2ES5	EQP	Y2ET4	3/3/2006	EB	TVOL	1,4-Dioxane	C2,C5
Groundwater (Winter)	Y2ES5	GW-06	Y2ET3	3/3/2006	REG	CSVOL	2,4-Dinitrophenol	C2
Groundwater (Winter)	Y2ES5	GW-06	Y2ET3	3/3/2006	REG	TVOL	1,4-Dioxane	C2,C5
Groundwater (Winter)	Y2ES5	HWF-15	Y2ER9	3/2/2006	REG	TVOL	1,4-Dioxane	C2,C5
Groundwater (Winter)	Y2ES5	HWF-26	Y2ES1	3/2/2006	REG	CSVOL	2,4-Dinitrophenol	C2
Groundwater (Winter)	Y2ES5	HWF-26	Y2ES1	3/2/2006	REG	TVOL	1,4-Dioxane	C2,C5
Groundwater (Winter)	Y2ES5	HWFM	Y2ES3	3/2/2006	REG	TVOL	1,4-Dioxane	C2,C5
Groundwater (Winter)	Y2ES5	LabQC	VBLK25	3/2/2006	QC	TVOL	1,4-Dioxane	C2,C5
Groundwater (Winter)	Y2ES5	LabQC	VHBLK01	3/2/2006	QC	TVOL	1,4-Dioxane	C2,C5
Groundwater (Winter)	Y2ES5	LabQC	VBLK23	3/2/2006	QC	TVOL	1,4-Dioxane	C2,C5
Groundwater (Winter)	Y2ES5	LabQC	VBLK17	3/2/2006	QC	TVOL	1,4-Dioxane	C2,C5
Groundwater (Winter)	Y2ES5	LabQC	Y2ET3MS	3/3/2006	QC	TVOL	1,4-Dioxane	C2,C5
Groundwater (Winter)	Y2ES5	LabQC	Y2ET3MSD	3/3/2006	QC	TVOL	1,4-Dioxane	C2,C5
Groundwater (Winter)	Y2ES5	MW-4	Y2ES5	3/2/2006	REG	CSVOL	2,4-Dinitrophenol	C2
Groundwater (Winter)	Y2ES5	MW-4	Y2ES5	3/2/2006	REG	TVOL	1,4-Dioxane	C2,C5
Groundwater (Winter)	Y2ES5	WWFM	Y2ET2	3/3/2006	REG	CSVOL	2,4-Dinitrophenol	C2
Groundwater (Winter)	Y2ES5	WWFM	Y2ET2	3/3/2006	REG	TVOL	1,4-Dioxane	C2,C5
Groundwater (Winter)	Y2ES5	WWFM	Y2ET2	3/3/2006	REG	TVOL	Vinyl chloride	A3
Groundwater (Summer)	Y2SR0	H-11	Y2SR0	9/13/2006	REG	SIMVOL	1,4-Dioxane	C2,C5
Groundwater (Summer)	Y2SR0	H-11	Y2SR0	9/13/2006	REG	TVOL	1,4-Dioxane	A3
Groundwater (Summer)	Y2SR0	H-11	Y2SR0	9/13/2006	REG	TVOL	Acetone	A3
Groundwater (Summer)	Y2SR0	HWF-26	Y2SS4	9/13/2006	REG	SIMVOL	1,4-Dioxane	C2,C5

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Groundwater (Summer)	Y2SR0	HWF-26	Y2SS4	9/13/2006	REG	TVOL	1,4-Dioxane	A3
Groundwater (Summer)	Y2SR0	HWF-26	Y2SS4	9/13/2006	REG	TVOL	Acetone	A3
Groundwater (Summer)	Y2SR0	WWFM	Y2ST4	9/12/2006	REG	TVOL	1,1,2-Trichloroethane	A3
Groundwater (Summer)	Y2SR0	WWFM	Y2ST4	9/12/2006	REG	TVOL	1,1,2-Trichloroethane	A3
Groundwater (Summer)	Y2SR0	WWFM	Y2ST4	9/12/2006	REG	TVOL	1,4-Dioxane	A3
Groundwater (Summer)	Y2SR0	WWFM	Y2ST4	9/12/2006	REG	TVOL	1,4-Dioxane	A3
Groundwater (Summer)	Y2SR0	WWFM	Y2ST4	9/12/2006	REG	TVOL	cis-1,2-Dichloroethene	A3
Groundwater (Summer)	Y2SR0	WWFM	Y2ST4	9/12/2006	REG	TVOL	cis-1,2-Dichloroethene	A3
Groundwater (Summer)	Y2SR0	WWFM	Y2ST4	9/12/2006	REG	TVOL	cis-1,3-Dichloropropene	A3
Groundwater (Summer)	Y2SR0	WWFM	Y2ST4	9/12/2006	REG	TVOL	cis-1,3-Dichloropropene	A3
Groundwater (Summer)	Y2SR0	WWFM	Y2ST4	9/12/2006	REG	TVOL	Ethylbenzene	A3
Groundwater (Summer)	Y2SR0	WWFM	Y2ST4	9/12/2006	REG	TVOL	Ethylbenzene	A3
Groundwater (Summer)	Y2SR0	WWFM	Y2ST4	9/12/2006	REG	TVOL	Isopropylbenzene	A3
Groundwater (Summer)	Y2SR0	WWFM	Y2ST4	9/12/2006	REG	TVOL	Isopropylbenzene	A3
Groundwater (Summer)	Y2SR0	WWFM	Y2ST4	9/12/2006	REG	TVOL	m&p-Xylene	A3
Groundwater (Summer)	Y2SR0	WWFM	Y2ST4	9/12/2006	REG	TVOL	m&p-Xylene	A3
Groundwater (Summer)	Y2SR0	WWFM	Y2ST4	9/12/2006	REG	TVOL	o-Xylene	A3
Groundwater (Summer)	Y2SR0	WWFM	Y2ST4	9/12/2006	REG	TVOL	o-Xylene	A3
Groundwater (Summer)	Y2SR0	WWFM	Y2ST4	9/12/2006	REG	TVOL	Styrene	A3
Groundwater (Summer)	Y2SR0	WWFM	Y2ST4	9/12/2006	REG	TVOL	Styrene	A3
Groundwater (Summer)	Y2SR0	WWFM	Y2ST4	9/12/2006	REG	TVOL	Tetrachloroethene	A3
Groundwater (Summer)	Y2SR0	WWFM	Y2ST4	9/12/2006	REG	TVOL	Tetrachloroethene	A3
Groundwater (Summer)	Y2SR0	WWFM	Y2ST4	9/12/2006	REG	TVOL	Toluene	A3
Groundwater (Summer)	Y2SR0	WWFM	Y2ST4	9/12/2006	REG	TVOL	Toluene	A3
Groundwater (Summer)	Y2SR0	WWFM	Y2ST4	9/12/2006	REG	TVOL	trans-1,2-Dichloroethene	A3
Groundwater (Summer)	Y2SR0	WWFM	Y2ST4	9/12/2006	REG	TVOL	trans-1,2-Dichloroethene	A3
Groundwater (Summer)	Y2SR0	WWFM	Y2ST4	9/12/2006	REG	TVOL	trans-1,3-Dichloropropene	A3
Groundwater (Summer)	Y2SR0	WWFM	Y2ST4	9/12/2006	REG	TVOL	trans-1,3-Dichloropropene	A3
Groundwater (Summer)	Y2SR0	WWFM	Y2ST4	9/12/2006	REG	TVOL	Trichloroethene	A3
Groundwater (Summer)	Y2SR0	WWFM	Y2ST4	9/12/2006	REG	TVOL	Trichloroethene	A3
Groundwater (Summer)	Y2SR0	WWFM	Y2ST4	9/12/2006	REG	TVOL	Vinyl chloride	A3
Groundwater (Summer)	Y2SR0	WWFM	Y2ST4	9/12/2006	REG	TVOL	Vinyl chloride	A3

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Groundwater (Summer)	Y2SS9	EQP-A	Y2SY7	8/29/2006	EB	SIMSVOL	Pentachlorophenol	C2,C5
Groundwater (Summer)	Y2SS9	EQP-A	Y2SY7	8/29/2006	EB	SIMVOL	1,4-Dioxane	C5
Groundwater (Summer)	Y2SS9	EQP-A	Y2SY7	8/29/2006	EB	TVOL	1,4-Dioxane	C2,C5
Groundwater (Summer)	Y2SS9	EQP-C	Y2SY8	9/1/2006	EB	SIMSVOL	Pentachlorophenol	C2,C5
Groundwater (Summer)	Y2SS9	EQP-C	Y2SY8	9/1/2006	EB	SIMVOL	1,4-Dioxane	C5
Groundwater (Summer)	Y2SS9	EQP-C	Y2SY8	9/1/2006	EB	TVOL	1,4-Dioxane	C2,C5
Groundwater (Summer)	Y2SS9	GW-01R	Y2SQ3	8/31/2006	REG	SIMSVOL	Pentachlorophenol	C2,C5
Groundwater (Summer)	Y2SS9	GW-01R	Y2SQ3	8/31/2006	REG	TVOL	1,4-Dioxane	C2,C5
Groundwater (Summer)	Y2SS9	GW-01R	Y2SQ3	8/31/2006	REG	TVOL	Acetone	A3
Groundwater (Summer)	Y2SS9	GW-02	Y2SQ4	8/31/2006	REG	SIMSVOL	Pentachlorophenol	C2,C5
Groundwater (Summer)	Y2SS9	GW-02	Y2SQ4	8/31/2006	REG	SIMVOL	1,4-Dioxane	C5
Groundwater (Summer)	Y2SS9	GW-02	Y2SQ4	8/31/2006	REG	TVOL	1,4-Dioxane	C2,C5
Groundwater (Summer)	Y2SS9	GW-02	Y2SQ4	8/31/2006	REG	TVOL	Acetone	A3
Groundwater (Summer)	Y2SS9	GW-06	Y2SQ7	9/1/2006	REG	SIMSVOL	Pentachlorophenol	C2,C5
Groundwater (Summer)	Y2SS9	GW-06	Y2SQ7	9/1/2006	REG	SIMVOL	1,4-Dioxane	C5
Groundwater (Summer)	Y2SS9	GW-06	Y2SQ7	9/1/2006	REG	TVOL	1,4-Dioxane	C2,C5
Groundwater (Summer)	Y2SS9	GW-06	Y2SQ7	9/1/2006	REG	TVOL	Acetone	A3
Groundwater (Summer)	Y2SS9	H-9	Y2SR8	8/30/2006	REG	SIMSVOL	Pentachlorophenol	C2,C5
Groundwater (Summer)	Y2SS9	H-9	Y2SR8	8/30/2006	REG	TVOL	1,4-Dioxane	C2,C5
Groundwater (Summer)	Y2SS9	H-9	Y2SR8	8/30/2006	REG	TVOL	Acetone	A3
Groundwater (Summer)	Y2SS9	H-9	Y2SR9	8/30/2006	FD	SIMSVOL	Pentachlorophenol	C2,C5
Groundwater (Summer)	Y2SS9	H-9	Y2SR9	8/30/2006	FD	TVOL	1,4-Dioxane	C2,C5
Groundwater (Summer)	Y2SS9	H-9	Y2SR9	8/30/2006	FD	TVOL	Acetone	A3
Groundwater (Summer)	Y2SS9	HWF-15	Y2SS1	8/31/2006	REG	SIMSVOL	Pentachlorophenol	C2,C5
Groundwater (Summer)	Y2SS9	HWF-15	Y2SS1	8/31/2006	REG	SIMVOL	1,4-Dioxane	C5
Groundwater (Summer)	Y2SS9	HWF-15	Y2SS1	8/31/2006	REG	TVOL	1,4-Dioxane	C2,C5
Groundwater (Summer)	Y2SS9	HWF-15	Y2SS1	8/31/2006	REG	TVOL	Acetone	A3
Groundwater (Summer)	Y2SS9	HWFM	Y2SS5	8/31/2006	REG	SIMSVOL	Pentachlorophenol	C2,C5
Groundwater (Summer)	Y2SS9	HWFM	Y2SS5	8/31/2006	REG	SIMVOL	1,4-Dioxane	C5
Groundwater (Summer)	Y2SS9	HWFM	Y2SS5	8/31/2006	REG	TVOL	1,4-Dioxane	C2,C5
Groundwater (Summer)	Y2SS9	HWFM	Y2SS5	8/31/2006	REG	TVOL	Acetone	A3
Groundwater (Summer)	Y2SS9	MW-4	Y2SS8	8/30/2006	REG	SIMSVOL	Pentachlorophenol	C2,C5

TABLE 3-3
Summary of Rejected Data
Remedial Investigation Report
ASARCO LLC Hayden, Arizona Plant Site

Sampling Event	Sample Delivery Group	Location ID	Sample ID	Sample Date	Sample Type	Analysis Method	Parameter	Validation Reason Code[1]
Groundwater (Summer)	Y2SS9	MW-4	Y2SS8	8/30/2006	REG	SIMVOL	1,4-Dioxane	C5
Groundwater (Summer)	Y2SS9	MW-4	Y2SS8	8/30/2006	REG	TVOL	1,4-Dioxane	C2,C5
Groundwater (Summer)	Y2SS9	MW-4	Y2SS8	8/30/2006	REG	TVOL	Acetone	A3
Groundwater (Summer)	Y2SS9	S-4A	Y2SS9	8/29/2006	REG	SIMSVOL	Pentachlorophenol	C2,C5
Groundwater (Summer)	Y2SS9	S-4A	Y2SS9	8/29/2006	REG	SIMVOL	1,4-Dioxane	C5
Groundwater (Summer)	Y2SS9	S-4A	Y2SS9	8/29/2006	REG	TVOL	1,4-Dioxane	C2,C5
Groundwater (Summer)	Y2SS9	S-4A	Y2SS9	8/29/2006	REG	TVOL	Acetone	A3

Table Notes:
[1] Validation reason codes are defined as follows:
A3 = Accuracy - Surrogate Recovery
C2 = Calibration - Initial Calibration Response Factor
C5 = Calibration - CCAL Response Factor
M2 = Compromised Filter Medium/Filter Damage
M3 = Non-uniform analyte deposit noted on the XRF sample data sheet
[2] EB = Equipment blank
[3] FD = Field duplicate
[4] QC = Laboratory quality control sample
[5] REG = Primary Sample

TABLE 3-4
Evaluation of Initial Soil Sampling Primary and Duplicate Relative Percent Difference
Remedial Investigation Report
ASARCO LLC Hayden, Arizona Plant Site

Location	Depth	Arsenic			Copper			Lead		
		Primary Result (mg/kg)	Duplicate Result (mg/kg)	Primary and Duplicate RPD (%)	Primary Result (mg/kg)	Duplicate Result (mg/kg)	Primary and Duplicate RPD (%)	Primary Result (mg/kg)	Duplicate Result (mg/kg)	Primary and Duplicate RPD (%)
Hayden Residential Properties:										
HSS-D-0-101-07-027	Surface	14.5	14.2	2.09	6,110	6,110	0.00	165	171	3.57
HSS-A-0-101-07-089Q	Surface	10.3	12.6	20.09	4,820	5,690	16.56	59.4	72.5	19.86
HSS-E-0-101-07-247	Surface	7.4	8.2	10.26	2,000	2,360	16.51	149	179	18.29
HSS-F-0-101-07-303	Surface	8.7	9.4	7.73	2,480	2,630	5.87	67.5	76.9	13.02
HSS-E-0-101-07-304A	Surface	28	25.5	9.35	7,350	6,070	19.08	146	136	7.09
HSS-B-0-101-09-010	Surface	11.6	12.5	7.47	3,040	3,040	0.00	140	143	2.12
HSS-H-0-101-09-047	Surface	18.6	21.5	14.46	12,400	12,000	3.28	510	1,070	70.89
HSS-C-0-101-09-070	Surface	19.1	16.9	12.22	3,420	2,740	22.08	305	312	2.27
HSS-I-0-101-09-106	Surface	24.1	25	3.67	7,070	7,480	5.64	514	610	17.08
HSS-D-0-101-09-134	Surface	11.5	11.7	1.72	2,370	2,650	11.16	52.9	58.9	10.73
Winkelman Residential Properties:										
WSS-G-0-101-12-071	Surface	13.8	14.1	2.15	442	444	0.45	59.3	60.7	2.33
WSS-F-0-101-12-136	Surface	4.8	5.2	8.00	243	243	0.00	53.5	50.1	6.56
Non-Residential Properties:										
PCON-06-SED-0	Surface	76.2 J+	74.9 J+	1.72	23,300	20,700	11.82	257 J	277 J	7.49
PHW-SED-05AS	Surface	75.3	77.4	2.75	12,200	12,100	0.82	239	242	1.25
PHW-SED-10AS	Surface	8.9	10	11.64	2,380	2,940	21.05	31.9	36.1	12.35
PSMT-01-SED-0	Surface	107	121	12.28	369,000	380,000	2.94	1,200	1,230	2.47
SPW-SED-11AS	Surface	17.7 J	19 J	7.08	2,860	3,050	6.43	62.6 J	64.6 J	3.14
UPA-04-SED-1	Subsurface	1.8	2.2	20.00	16.6	16.9	1.79	5.1	5.5	7.55
Average RPD:				**8.59**			**8.08**			**11.56**

Table Notes:

[1] % = Percent

[2] J = Estimated value

[3] J+ = Estimated value, may be biased high

[4] mg/kg = milligrams per kilogram

[5] RPD = Relative Percent Difference

[6] Subsurface = The sample was collected approximately 10-12 inches below surface.

[7] Surface = The sample was collected approximately 0-2 inches below surface.

TABLE 3-5
Evaluation of Initial, Supplemental, and Comprehensive Soil Sampling Relative Percent Difference
Remedial Investigation Report
ASARCO LLC Hayden, Arizona Plant Site

		Arsenic						Copper						Lead					
Location	Depth	Initial Result (mg/kg)	Supplemental Result (mg/kg)	Comprehensive Result (mg/kg)	Initial and Supplemental RPD (%)	Supplemental and Comprehensive RPD (%)	Initial and Comprehensive RPD (%)	Initial Result (mg/kg)	Supplemental Result (mg/kg)	Comprehensive Result (mg/kg)	Initial and Supplemental RPD (%)	Supplemental and Comprehensive RPD (%)	Initial and Comprehensive RPD (%)	Initial Result (mg/kg)	Supplemental Result (mg/kg)	Comprehensive Result (mg/kg)	Initial and Supplemental RPD (%)	Supplemental and Comprehensive RPD (%)	Initial and Comprehensive RPD (%)
Hayden Residential Properties:																			
HSS-D-0-101-07-008	Surface	92.8	113 J-	--	19.63	--	--	20,200	20,200 J-	--	0.00	--	--	362	388 J-	--	6.93	--	--
HSS-E-0-101-07-010	Surface	20.4	27.8 J-	--	30.71	--	--	5,740	7,860 J-	--	31.18	--	--	213	223 J-	--	4.59	--	--
HSS-D-0-101-07-014	Surface	19.1	20.6 J-	--	7.56	--	--	6,250	7,900 J-	--	23.32	--	--	536	411 J-	--	26.40	--	--
HSS-I-0-101-07-018	Surface	54.5	56.4 J-	--	3.43	--	--	4,060	5,380 J-	--	27.97	--	--	687	1,140 J-	--	49.59	--	--
HSS-C-0-101-07-028	Surface	20.5	25.1 J-	--	20.18	--	--	2,800	3,140 J-	--	11.45	--	--	75.8	86.9 J-	--	13.64	--	--
HSS-B-0-101-07-029	Surface	36.5	46.1 J-	--	23.24	--	--	9,610	10,800 J-	--	11.66	--	--	219	249 J-	--	12.82	--	--
HSS-A-0-101-07-030	Surface	8.8	12.8 J-	--	37.04	--	--	3,680	3,740 J-	--	1.62	--	--	88.5	91.5 J-	--	3.33	--	--
HSS-F-0-101-07-034	Surface	95.6	123 J-	--	25.07	--	--	32,700	28,300 J-	--	14.43	--	--	647	788 J-	--	19.65	--	--
HSS-A-0-101-07-035AN	Surface	0.4 U	17.3	--	ND	--	--	20,700	19,100	--	8.04	--	--	47.1	48.1 J	--	2.10	--	--
HSS-B-0-101-07-035AS	Surface	1.6	23 J-	--	173.98	--	--	19,000	16,100 J-	--	16.52	--	--	39.8	46.4 J-	--	15.31	--	--
HSS-A-0-101-07-037	Surface	53.8	81.4 J-	83.6 J-	40.83	2.67	43.38	20,700	23,900 J-	21,500 J-	14.35	10.57	3.79	323	398 J-	361 J-	20.80	9.75	11.11
HSS-F-0-101-07-040	Surface	--	8.3 J-	11.3 J-	--	30.61	--	--	2,670 J-	3,330 J-	--	22.00	--	--	56.9 J-	69.0 J-	--	19.22	--
HSS-I-0-101-07-040	Surface	62.7	98.3 J-	--	44.22	--	--	37,800	41,800 J-	--	10.05	--	--	320	362 J-	--	12.32	--	--
HSS-E-0-101-07-042	Surface	13	--	18.8 J-	--	--	36.48	4,000	--	3,930 J-	--	--	1.77	214	--	218 J-	--	--	1.85
HSS-D-0-101-07-047	Surface	50.1	65.3	69.3 J-	26.34	5.94	32.16	15,100	16,100	15,600 J-	6.41	3.15	3.26	856	827 J	915 J-	3.45	10.10	6.66
HSS-D-0-101-07-052	Surface	56.2	52.4 J-	--	7.00	--	--	15,900	11,600 J-	--	31.27	--	--	363	344 J-	--	5.37	--	--
HSS-F-0-101-07-062	Surface	42.6	58.5 J-	--	31.45	--	--	11,200	11,500 J-	--	2.64	--	--	208	268 J-	--	25.21	--	--
HSS-F-0-101-07-089K	Surface	60.6	81.1 J-	--	28.93	--	--	11,300	12,000 J-	--	6.01	--	--	171	200 J-	--	15.63	--	--
HSS-D-0-101-07-089S	Surface	70.6	87.9 J-	--	21.83	--	--	25,200	23,900 J-	--	5.30	--	--	276	265 J-	--	4.07	--	--
HSS-D-0-101-07-089T	Surface	51.8	63.6	--	20.45	--	--	15,400	15,500	--	0.65	--	--	197	189 J	--	4.15	--	--
HSS-G-0-101-07-089T	Surface	77.9	98.5 J-	--	23.36	--	--	5,250	6,760 J-	--	25.15	--	--	117	148 J-	--	23.40	--	--
HSS-I-0-101-07-089T	Surface	790	865 J-	--	9.06	--	--	19,700	18,800 J-	--	4.68	--	--	423	436 J-	--	3.03	--	--
HSS-I-0-101-07-089U	Surface	9.8	13.8 J-	--	33.90	--	--	3,710	3,970 J-	--	6.77	--	--	41.9	42.9 J-	--	2.36	--	--
HSS-D-0-101-07-090	Surface	20	40.1 J-	--	66.89	--	--	12,600	15,400 J-	--	20.00	--	--	178	223 J-	--	22.44	--	--
HSS-E-0-101-07-091	Surface	32.5	48.9 J-	--	40.29	--	--	11,100	10,800 J-	--	2.74	--	--	198	183 J-	--	7.87	--	--
HSS-G-0-101-07-099	Surface	68.7	91.9 J-	--	28.89	--	--	16,800	13,700 J-	--	20.33	--	--	303	286 J-	--	5.77	--	--
HSS-A-0-101-07-105	Surface	14.9	24.8 J-	--	49.87	--	--	4,420	6,580 J-	--	39.27	--	--	102	126 J-	--	21.05	--	--
HSS-G-0-101-07-117	Surface	29.1	42.6 J-	--	37.66	--	--	7,880	9,490 J-	--	18.54	--	--	266	343 J-	--	25.29	--	--
HSS-E-0-101-07-176	Surface	183	213 J-	--	15.15	--	--	1,590	1,690 J-	--	6.10	--	--	191	213 J-	--	10.89	--	--
HSS-B-0-101-07-270	Surface	38.4	67.7 J-	--	55.23	--	--	12,200	15,500 J-	--	23.83	--	--	219	315 J-	--	35.96	--	--
HSS-G-0-101-09-004	Surface	27.8	--	30.4 J-	--	--	8.93	4,320	--	3,790 J-	--	--	13.07	342	--	331 J-	--	--	3.27
HSS-H-0-101-09-004	Surface	33.3	33.5 J-	--	0.60	--	--	8,870	7,680 J-	--	14.38	--	--	8,170	6,190 J-	--	27.58	--	--
HSS-H-0-101-09-008	Surface	39.3	57.1 J-	--	36.93	--	--	11,900	12,700 J-	--	6.50	--	--	323	413 J-	--	24.46	--	--
HSS-B-0-101-09-010	Surface	11.6	13.8 J-	12.2 J-	17.32	12.31	5.04	3,040	3,340 J-	2,330 J-	9.40	35.63	26.44	140	1,140 J-	611 J-	156.25	60.42	125.43
HSS-F-0-101-09-032	Surface	14.2	23 J-	--	47.31	--	--	8,200	8,480 J-	--	3.36	--	--	243	291 J-	--	17.98	--	--
HSS-A-0-101-09-033	Surface	69.4	89.1 J-	--	24.86	--	--	15,900	17,500 J-	--	9.58	--	--	1,610	1,320 J-	--	19.80	--	--
HSS-F-0-101-09-036	Surface	24.1	34.3 J-	--	34.93	--	--	8,850	9,680 J-	--	8.96	--	--	321	382 J-	--	17.35	--	--
HSS-D-0-101-09-038	Surface	64.5	82.7 J-	--	24.73	--	--	14,900	14,400 J-	--	3.41	--	--	402	460 J-	--	13.46	--	--
HSS-H-0-101-09-064	Surface	58.6	74.7 J-	--	24.16	--	--	18,500	17,400 J-	--	6.13	--	--	360	398 J-	--	10.03	--	--
HSS-B-0-101-09-067	Surface	16.7	20.7 J-	20.7 J-	21.39	0.00	21.39	3,550	4,700 J-	3,690 J-	27.88	24.08	3.87	307	718 J-	347 J-	80.20	69.67	12.23
HSS-E-0-101-09-070	Surface	24.3	31.1 J-	--	24.55	--	--	11,200	13,400 J-	--	17.89	--	--	4,690	4,860 J-	--	3.56	--	--
HSS-C-0-101-09-077	Surface	46.3	50.3 J-	66.3 J-	8.28	27.44	35.52	6,480	5,790 J-	6,590 J-	11.25	12.92	1.68	7,250	4,270 J-	1,970 J-	51.74	73.72	114.53
HSS-H-0-101-09-084	Surface	28.1	34.3	--	19.87	--	--	6,680	7,100	--	6.10	--	--	1,200	1,840 J	--	42.11	--	--
HSS-B-0-101-09-088	Surface	21.8	32.3 J-	--	38.82	--	--	1,950	2,150 J-	--	9.76	--	--	92,600	87,200 J-	--	6.01	--	--
HSS-H-0-101-09-104	Surface	32.9	52.1 J-	--	45.18	--	--	11,400	11,700 J-	--	2.60	--	--	247	282 J-	--	13.23	--	--
HSS-D-0-101-09-106	Surface	64.7	88.3 J-	--	30.85	--	--	15,800	15,300 J-	--	3.22	--	--	2,990	1,210 J-	--	84.76	--	--
HSS-A-0-101-09-107	Surface	31.1	41.1 J-	--	27.70	--	--	13,100	12,400 J-	--	5.49	--	--	228	305 J-	--	28.89	--	--
HSS-B-0-101-09-108	Surface	26.4	40.2	--	41.44	--	--	9,050	10,300	--	12.92	--	--	766	487	--	44.53	--	--
HSS-H-0-101-09-109	Surface	36.9	50.9 J-	--	31.89	--	--	15,300	12,400 J-	--	20.94	--	--	512	867 J-	--	51.49	--	--
HSS-F-0-101-09-111B	Surface	55.7	79.9 J-	75.0 J-	35.69	6.33	29.53	14,300	18,200 J-	17,200 J-	24.00	5.65	18.41	284	337 J-	293 J-	17.07	13.97	3.12
HSS-D-0-101-09-115	Surface	8.9	9 J-	--	1.12	--	--	2,210	2,310 J-	--	4.42	--	--	54.5	57 J-	--	4.48	--	--
HSS-C-0-101-09-120	Surface	36	45.5 J-	--	23.31	--	--	9,000	8,690 J-	--	3.50	--	--	208	232 J-	--	10.91	--	--
Winkelman Residential Properties:																			
WSS-C-0-101-12-008J	Surface	20	--	22.5 J-	--	--	11.76	315	--	342 J-	--	--	8.22	130	--	198 J-	--	--	41.46
WSS-B-0-101-12-008K	Surface	2.3	--	3.6 J-	--	--	44.07	426	--	509 J-	--	--	17.75	31.2	--	37.1 J-	--	--	17.28

TABLE 3-5
Evaluation of Initial, Supplemental, and Comprehensive Soil Sampling Relative Percent Difference
Remedial Investigation Report
ASARCO LLC Hayden, Arizona Plant Site

		Arsenic						Copper						Lead					
Location	**Depth**	**Initial Result (mg/kg)**	**Supplemental Result (mg/kg)**	**Comprehensive Result (mg/kg)**	**Initial and Supplemental RPD (%)**	**Supplemental and Comprehensive RPD (%)**	**Initial and Comprehensive RPD (%)**	**Initial Result (mg/kg)**	**Supplemental Result (mg/kg)**	**Comprehensive Result (mg/kg)**	**Initial and Supplemental RPD (%)**	**Supplemental and Comprehensive RPD (%)**	**Initial and Comprehensive RPD (%)**	**Initial Result (mg/kg)**	**Supplemental Result (mg/kg)**	**Comprehensive Result (mg/kg)**	**Initial and Supplemental RPD (%)**	**Supplemental and Comprehensive RPD (%)**	**Initial and Comprehensive RPD (%)**
WSS-G-0-101-12-071	Surface	13.8	17.3 J-	14.6 J-	22.51	16.93	5.63	442	506 J-	431 J-	13.50	16.01	2.52	59.3	70.7 J-	62.3 J-	17.54	12.63	4.93
WSS-F-0-101-12-073	Surface	5.1	--	5.4 J-	--	--	5.71	426	--	389 J-	--	--	9.08	90.3	--	93.5 J-	--	--	3.48
WSS-A-0-101-12-142	Surface	6	--	11.8 J-	--	--	65.17	674	--	1,170 J-	--	--	53.80	285	--	491 J-	--	--	53.09
WSS-G-0-101-12-150	Surface	3.6	--	4.7 J-	--	--	26.51	595	--	632 J-	--	--	6.03	53	--	89.5 J-	--	--	51.23
WSS-E-0-101-12-188B	Surface	3.5	--	3.7 J-	--	--	5.56	241	--	220 J-	--	--	9.11	22.4	--	28.2 J-	--	--	22.92
WSS-D-0-101-12-236	Surface	6.6	--	7.3 J-	--	--	10.07	1,050	--	971 J-	--	--	7.82	143	--	126 J-	--	--	12.64
WSS-D-0-101-12-267	Surface	6.7	--	6.5 J-	--	--	3.03	284	--	328 J-	--	--	14.38	42.5	--	45.6 J-	--	--	7.04
Non-Residential Properties:																			
HGC-10-SED-0	Surface	3.7 J	--	4.7 J-	--	--	23.81	391	--	381 J-	--	--	2.59	19.8 J	--	21.4 J-	--	--	7.77
HGC-30-SED-0	Surface	81.1 J	--	87.8 J-	--	--	7.93	9,320	--	9,210 J-	--	--	1.19	191 J	--	193 J-	--	--	1.04
HPUB-01-SED-0	Surface	40.7	--	60.9 J-	--	--	39.76	22,400	--	24,400 J-	--	--	8.55	204 J	--	209 J-	--	--	2.42
KS-02-SED-0	Surface	345 J	--	307 J-	--	--	11.66	18,400	--	15,900 J-	--	--	14.58	547 J	--	481 J-	--	--	12.84
KS-04-SED-0	Surface	60.1 J+	--	99.4 J-	--	--	49.28	68,200	--	63,800 J-	--	--	6.67	325 J	--	297 J-	--	--	9.00
PCON-11-SED-0	Surface	40	--	81.6 J-	--	--	68.42	53,800	--	57,800 J-	--	--	7.17	231	--	268 J-	--	--	14.83
PCON-23-SED-0	Surface	635	--	769 J-	--	--	19.09	12,600	--	11,000 J-	--	--	13.56	222	--	275 J-	--	--	21.33
PCON-24-SED-0	Surface	13.2	--	23.3 J-	--	--	55.34	10,200	--	10,400 J-	--	--	1.94	65.4	--	76.1 J-	--	--	15.12
SPW-SED-16AS	Surface	--	28	11.1	--	86.45	--	--	4,700	5,160	--	9.33	--	--	17	17.7	--	4.03	--
WSC-18-SED-0	Surface	2.3 J	--	3.4 J-	--	--	38.60	65.8	--	132 J-	--	--	66.94	10.4 J	--	13.3 J-	--	--	24.47
Average RPD:					**30.73**	**20.96**	**27.07**				**12.31**	**15.48**	**12.47**				**22.94**	**30.39**	**23.12**

Table Notes:
[1] -- = Not calculated
[2] % = Percent
[3] Comprehensive = During the Comprehensive soil sampling event, samples were collected during the Initial soil sampling event (January 30, 2006 through February 24, 2006) and were retained in secure storage until shipment on August 21, 2007 through September 14, 2007.
[4] Initial = During the Initial soil sampling event, samples were collected and shipped between January 30, 2006 and February 24, 2006.
[5] J = Estimated value
[6] J+ = Estimated value, may be biased high
[7] J- = Estimated value, may be biased low
[8] mg/kg = milligrams per kilogram
[9] ND = The RPD could not be calculated if one sample result was not detected.
[10] RPD = Relative Percent Difference
[11] Supplemental = During the Supplemental soil sampling event, samples were collected during the Initial soil sampling event (January 30, 2006 through February 24, 2006) and were retained in secure storage until shipment on September 26, 2006 through November 28, 2006.
[12] Surface = The sample was collected approximately 0-2 inches below surface.
[13] U = Not detected; reporting limit is shown in place of a result.

TABLE 4-1
Summary of Inorganic Detections and Exceedances in Soil
Hayden Residential, Winkelman Residential and Non-Residential Properties
Remedial Investigation Report
ASARCO LLC Hayden, Arizona Plant Site

Parameter	Total Number of Samples	Number of Detections	Frequency of Detection (%)	Number of Detected Exceedances[1]	Frequency of Detected Exceedances (%)	Number of Non-Detected Exceedances[2]	Frequency of Non-Detect Exceedances (%)
Aluminum	281	281	100.00	0	0.00	0	0.00
Antimony	281	263	93.59	3	1.07	0	0.00
Arsenic	1,817	1,809	99.56	1,809	99.56	8	0.44
Barium	281	281	100.00	0	0.00	0	0.00
Beryllium	281	34	12.10	0	0.00	0	0.00
Boron	126	124	98.41	0	0.00	0	0.00
Cadmium	281	263	93.59	3	1.07	0	0.00
Calcium	281	281	100.00	0	0.00	0	0.00
Chromium	281	269	95.73	0	0.00	0	0.00
Cobalt	281	281	100.00	0	0.00	0	0.00
Copper	1,817	1,817	100.00	929	51.13	0	0.00
Cyanide	280	85	30.36	0	0.00	0	0.00
Iron	281	281	100.00	122	43.42	0	0.00
Lead	1,817	1,817	100.00	219	12.05	0	0.00
Magnesium	281	281	100.00	0	0.00	0	0.00
Manganese	281	281	100.00	0	0.00	0	0.00
Mercury	281	255	90.75	0	0.00	0	0.00
Molybdenum	127	127	100.00	9	7.09	0	0.00
Nickel	281	281	100.00	0	0.00	0	0.00
Potassium	281	281	100.00	0	0.00	0	0.00
Selenium	281	188	66.90	0	0.00	0	0.00
Silver	281	271	96.44	1	0.36	0	0.00
Sodium	281	254	90.39	0	0.00	0	0.00
Thallium	281	77	27.40	1	0.36	1	0.36
Vanadium	281	279	99.29	9	3.20	0	0.00
Zinc	281	280	99.64	0	0.00	0	0.00

Table Notes:
[1] A result is considered a detected exceedance if the result is detected and is greater than or equal to one or more of the comparison criteria.
[2] A result is considered a non-detected exceedance if the result is non-detected but the reporting limit is greater than or equal to one or more of the comparison criteria.
[3] The comparison criteria used in association with soil analysis are Arizona Residential Soil Remediation Levels and EPA Region IX Preliminary Remediation Goals.

TABLE 4-2

Comparison of Mean and Upper Tolerance Limit Background Values with State-wide Background Values for Transition, Basin and Range Provinces
Hayden ASARCO Smelter Site
Remedial Investigation Report
ASARCO LLC Hayden, Arizona Plant Site

Parameter	Units	Mean of Transition Zone and Basin and Range Background[1]	Mean of Overall Site Background[2]	Mean of Ts Background for Hayden Soils[3]	UTL of Ts Background for Hayden Soils	Mean of Qo Background for Winkelman Soils[4]	UTL of Qo Background for Winkelman Soils
Arsenic	mg/kg	12.7	7.2	6.3	**12.5**	6.3	**9.1**
Copper	mg/kg	34.4	746	460.5	**1,270**	500.8	**882**
Lead	mg/kg	30	209	28.3	**47.9**	31.7	**45.8**

Table Notes:

[1] Based on "Evaluation of Background Metals Concentrations in Arizona Soils" (Earth Technology Corporation, 1991)

[2] Based on all available site background samples, regardless of geologic map unit location (2003 ESI, 2004 RA, and current RI)

[3] Background soil sample data for Tertiary Sediment (Ts) geologic map unit, included expanded RI dataset

[4] Background soil sample data for Older Quaternary Deposits (Qo) geologic map unit

[5] Bold values with bold outline indicate site-specific background concentrations.

[6] UTL = Upper Tolerance Limit

TABLE 4-3
Summary of Mean, Minimum and Maximum Soil Sampling Laboratory Values for Arsenic, Copper and Lead
Non-Residential Properties
Remedial Investigation Report
ASARCO LLC Hayden, Arizona Plant Site

Arizona Residential Soil Remediation Level[1] (mg/kg):		**10**			**3,100**			**400**		
EPA Region IX Preliminary Remediation Goal[2] (mg/kg):		**0.39**			**3,100**			**400**		
		Arsenic			**Copper**			**Lead**		
Non-Residential Location Group	**Units**	**Mean Detected**	**Minimum Detected**	**Maximum Detected**	**Mean Detected**	**Minimum Detected**	**Maximum Detected**	**Mean Detected**	**Minimum Detected**	**Maximum Detected**
ASARCO Concentrator Property:										
Former Kennecott Smelter (KS)	mg/kg	**99.5**	**2**	**345**	**50,200**	**7,130**	**192,000**	285	18.6	**552**
Perimeter of Concentrator (PCON)	mg/kg	**128**	**0.41**	**1,720**	**22,100**	1,980	**69,300**	139	18.8	348
Crusher Facility (CF)	mg/kg	**33.6**	**1.9**	**52.7**	**39,200**	390	**131,000**	72.4	3.5	156
ASARCO Smelter Property:										
Perimeter of Smelter (PSMT)	mg/kg	**114**	**107**	**121**	**375,000**	**369,000**	**380,000**	**1,220**	**1,200**	**1,230**
Slag Dump and Downgradient of Slag Dump (SD and SDD)	mg/kg	**143**	**23.8**	**361**	**19,600**	1,400	**47,200**	226	23.2	**468**
ASARCO Tailings Impoundments:										
Tailings Pond AB/BC (TPA)	mg/kg	**14.7**	**4.8**	**27.3**	2,390	1,450	**3,730**	49.3	8.2	110
Tailings Pond D (TPD)	mg/kg	**12.5**	**10**	**18.1**	**3,710**	2,250	**6,000**	43.3	24.9	59.2
Adjacent Washes in Hayden:										
Power House Wash (PHW)	mg/kg	**28.4**	**4.6**	**77.4**	**6710**	1,230	**12200**	94.9	13.3	242
Kennecott Avenue Wash (KAW)	mg/kg	**8.18**	**1.6**	**22**	**3,790**	567	**13,500**	32.6	5.3	97.7
San Pedro Wash (SPW)	mg/kg	**17.2**	**5.5**	**29.7**	**5390**	926	**12500**	56.7	12	129
Non-ASARCO Property:										
Hayden Public Areas (HPUB)	mg/kg	**17.2**	**3.7**	**60.9**	**5,860**	42.6	**24,400**	67.9	12.9	209
Hayden Golf Course (HGC)	mg/kg	**14.2**	**1.3**	**87.8**	1,900	74.4	**14,700**	46.1	6.6	227
Winkleman School Complex (WSC)	mg/kg	**4.53**	**1.3**	**14.9**	371	20	1,210	19.4	3.4	48.2
Winkelman School Housing Lot A (WSCLA)	mg/kg	**7.53**	**4.3**	**10.3**	844	49.3	2,670	41.9	16.5	91.4
Winkelman School Housing Lot B (WSCLB)	mg/kg	**5.85**	**3.5**	**7.5**	519	85.2	1,380	26.9	18.4	38.7
Winkelman School Housing Lot C (WSCLC)	mg/kg	**4.39**	**1.9**	**6.9**	353	64.3	930	20.3	9.6	37
State Route 77 (SR77)	mg/kg	**25.9**	**10**	**39.1**	**3,190**	622	**8,130**	92.2	20.6	231
Upland Areas (UP and UPA)	mg/kg	**11.1**	**1.8**	**70**	1,440	16.6	**10,200**	43.5	5.1	247

Table Notes:
[1] Arizona Department of Environmental Quality Residential Soil Remediation Levels, Title 18 Chapter 7, January 2
[2] EPA Region IX Preliminary Remediation Goals, Residential Soil, October 20
[3] Bold values with bold outline exceed one or more of the comparison crite
[4] mg/kg = milligrams per kilogra

TABLE 4-4
Soil Sampling Laboratory Values for Arsenic, Copper and Lead
ASARCO Concentrator, Crusher Facility and Smelter Site
Remedial Investigation Report
ASARCO LLC Hayden, Arizona Plant Site

The data in this table are illustrated on figures 4-2, 4-3, 4-4, 4-6, 4-7, 4-8, 4-12, 4-14, and 4-16.

Arizona Residential Soil Remediation Level[1] (mg/kg):						**10**		**3,100**		**400**	
EPA Region IX Preliminary Remediation Goal[2] (mg/kg):						**0.39**		**3,100**		**400**	
Location/	**Sample**	**Shipment**		**Sample**		**Arsenic**		**Copper**		**Lead**	
Parcel ID	**Date**	**Date**	**Depth**	**Type**	**Units**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**
Crusher Facility:											
CF-01-SED-0	02/22/06	08/22/07	Surface	REG	mg/kg	**27.6**	J-	**12,000**	J-	56.9	J-
CF-02-SED-0	02/22/06	08/22/07	Surface	REG	mg/kg	**45.8**	J-	**23,300**	J-	95.1	J-
CF-03-SED-0	02/22/06	08/22/07	Surface	REG	mg/kg	**31.6**	J-	**29,000**	J-	45.2	J-
CF-04-SED-0	02/22/06	08/22/07	Surface	REG	mg/kg	**42.4**	J-	**57,600**	J-	102	J-
CF-05-SED-0	02/22/06	08/22/07	Surface	REG	mg/kg	**1.9**	J-	390	J-	3.5	J-
CF-06-SED-0	02/22/06	08/22/07	Surface	REG	mg/kg	**33.0**	J-	**131,000**	J-	48.4	J-
CF-07-SED-0	02/22/06	08/22/07	Surface	REG	mg/kg	**52.7**	J-	**21,200**	J-	156	J-
Former Kennecott Smelter:											
KS-01-SED-0	02/21/06	02/24/06	Surface	REG	mg/kg	**224**	J+	**56,200**		253	J
KS-02-SED-0	02/21/06	02/24/06	Surface	REG	mg/kg	**345**	J	**18,400**		**547**	J
KS-02-SED-0	02/21/06	09/14/07	Surface	REG	mg/kg	**307**	J-	**15,900**	J-	**481**	J-
KS-03-SED-0	02/21/06	02/24/06	Surface	REG	mg/kg	**140**	J	**56,700**		391	J
KS-04-SED-0	02/21/06	02/24/06	Surface	REG	mg/kg	**60.1**	J+	**68,200**		325	J
KS-04-SED-0	02/21/06	09/14/07	Surface	REG	mg/kg	**99.4**	J-	**63,800**	J-	297	J-
KS-05-SED-0	02/21/06	08/24/07	Surface	REG	mg/kg	**13.4**	J-	**7,710**	J-	30.7	J-
KS-05-SED-0	02/21/06	08/24/07	Surface	FD	mg/kg	**12.9**	J-	**7,540**	J-	31.0	J-
KS-06-SED-0	02/21/06	02/24/06	Surface	REG	mg/kg	***2***	UJ	**192,000**		333	J
KS-07-SED-0	02/21/06	08/24/07	Surface	REG	mg/kg	**12.4**	J-	**7,400**	J-	31.4	J-
KS-08-SED-0	02/21/06	02/24/06	Surface	REG	mg/kg	**114**	J	**92,800**		**539**	J
KS-09-SED-0	02/21/06	02/24/06	Surface	REG	mg/kg	**91.6**	J	**132,999**		**552**	J
KS-10-SED-0	02/21/06	08/24/07	Surface	REG	mg/kg	**9.1**	J-	**7,130**	J-	18.6	J-
KS-11-SED-0	02/21/06	08/24/07	Surface	REG	mg/kg	**106**		**66,800**		172	
KS-12-SED-0	02/21/06	08/24/07	Surface	REG	mg/kg	**54.2**		**31,400**		242	
KS-13-SED-0	02/21/06	08/24/07	Surface	REG	mg/kg	**38.5**		**9,420**		179	
KS-14-SED-0	02/21/06	08/24/07	Surface	REG	mg/kg	**90.7**		**48,600**		**450**	
KS-15-SED-0	02/21/06	08/24/07	Surface	REG	mg/kg	**70.2**		**19,800**		254	
Perimeter of Concentrator:											
PCON-01-SED-0	02/21/06	08/24/07	Surface	REG	mg/kg	**30.1**		**7,170**		67.7	
PCON-02-SED-0	02/21/06	08/24/07	Surface	REG	mg/kg	**19.2**	J	**40,100**		48.5	
PCON-02-SED-0	02/21/06	08/24/07	Surface	FD	mg/kg	**24.6**		**41,100**		50.2	
PCON-03-SED-0	02/21/06	08/24/07	Surface	REG	mg/kg	**65.4**		**19,100**		259	
PCON-04-SED-0	02/21/06	08/24/07	Surface	REG	mg/kg	**43.5**		**20,700**		117	
PCON-05-SED-0	02/21/06	02/24/06	Surface	REG	mg/kg	**17.6**	J+	**25,500**		96.7	J
PCON-06-SED-0	02/21/06	02/24/06	Surface	REG	mg/kg	**76.2**	J+	**23,300**		257	J
PCON-06-SED-0	02/21/06	02/24/06	Surface	FD	mg/kg	**74.9**	J+	**20,700**		277	J
PCON-08-SED-0	02/22/06	08/24/07	Surface	REG	mg/kg	**5.3**		**3,540**		18.8	
PCON-09-SED-0	02/22/06	08/24/07	Surface	REG	mg/kg	**8.5**		**3,300**		37.5	

TABLE 4-4
Soil Sampling Laboratory Values for Arsenic, Copper and Lead
ASARCO Concentrator, Crusher Facility and Smelter Site
Remedial Investigation Report
ASARCO LLC Hayden, Arizona Plant Site

The data in this table are illustrated on figures 4-2, 4-3, 4-4, 4-6, 4-7, 4-8, 4-12, 4-14, and 4-16.

Arizona Residential Soil Remediation Level[1] (mg/kg):						**10**		**3,100**		**400**	
EPA Region IX Preliminary Remediation Goal[2] (mg/kg):						**0.39**		**3,100**		**400**	
Location/	**Sample**	**Shipment**		**Sample**		**Arsenic**		**Copper**		**Lead**	
Parcel ID	**Date**	**Date**	**Depth**	**Type**	**Units**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**
PCON-10-SED-0	02/22/06	08/24/07	Surface	REG	mg/kg	**34.8**		**24,900**		72.6	
PCON-11-SED-0	02/22/06	02/24/06	Surface	REG	mg/kg	**40**		**53,800**		231	
PCON-11-SED-0	02/22/06	09/14/07	Surface	REG	mg/kg	**81.6**	J-	**57,800**	J-	268	J-
PCON-12-SED-0	02/22/06	08/24/07	Surface	REG	mg/kg	**68.1**		**69,300**		163	
PCON-13-SED-0	02/22/06	08/24/07	Surface	REG	mg/kg	**27.8**		**5,740**		84.3	
PCON-14-SED-0	02/22/06	02/24/06	Surface	REG	mg/kg	***0.41***	U	**46,300**		68.7	
PCON-15-SED-0	02/22/06	08/24/07	Surface	REG	mg/kg	**18.7**		**10,900**		62.2	
PCON-15-SED-0	02/22/06	08/24/07	Surface	FD	mg/kg	**21.2**		**11,200**		51.6	
PCON-16-SED-0	02/22/06	08/24/07	Surface	REG	mg/kg	**13.4**		**9,510**		47.4	
PCON-17-SED-0	02/22/06	08/24/07	Surface	REG	mg/kg	**12.9**		**7,530**		21.3	
PCON-18-SED-0	02/22/06	08/24/07	Surface	REG	mg/kg	**10.5**		2,440		38.9	
PCON-19-SED-0	02/22/06	08/24/07	Surface	REG	mg/kg	**57.6**	J-	**17,700**	J-	158	J-
PCON-20-SED-0	02/22/06	02/24/06	Surface	REG	mg/kg	**1,720**		**14,100**		260	
PCON-21-SED-0	02/22/06	02/24/06	Surface	REG	mg/kg	**140**		**35,000**		329	
PCON-22-SED-0	02/22/06	02/24/06	Surface	REG	mg/kg	**91.3**		**18,500**		200	
PCON-23-SED-0	02/22/06	02/24/06	Surface	REG	mg/kg	**635**		**12,600**		222	
PCON-23-SED-0	02/22/06	09/14/07	Surface	REG	mg/kg	**769**	J-	**11,000**	J-	275	J-
PCON-24-SED-0	02/22/06	02/24/06	Surface	REG	mg/kg	**13.2**		**10,200**		65.4	
PCON-24-SED-0	02/22/06	09/14/07	Surface	REG	mg/kg	**23.3**	J-	**10,400**	J-	76.1	J-
PCON-25-SED-0	02/22/06	02/24/06	Surface	REG	mg/kg	**18.1**		**59,700**		348	
PCON-26-SED-0	02/23/06	02/24/06	Surface	REG	mg/kg	**9.3**		**7,540**		45.6	J
PCON-27-SED-0	02/23/06	08/24/07	Surface	REG	mg/kg	**32.6**	J-	**26,100**	J-	226	J-
PCON-28-SED-0	02/23/06	08/24/07	Surface	REG	mg/kg	**17.9**	J-	1,980	J-	54.6	J-
Perimeter of Smelter:											
PSMT-01-SED-0	02/23/06	02/24/06	Surface	REG	mg/kg	**107**		**369,000**		**1,200**	
PSMT-01-SED-0	02/23/06	02/24/06	Surface	FD	mg/kg	**121**		**380,000**		**1,230**	
Slag Dump:											
SD-01-SED-0	02/23/06	02/24/06	Surface	REG	mg/kg	**24.7**		**47,200**		**468**	
Downgradient of Slag Dump:											
SDD-01-SED-0	02/23/06	02/24/06	Surface	REG	mg/kg	**361**		**12,100**		308	
SDD-02-SED-0	02/23/06	02/24/06	Surface	REG	mg/kg	**232**		**10,200**		220	
SDD-03-SED-0	02/23/06	02/24/06	Surface	REG	mg/kg	**74**		**27,000**		112	
SDD-04-SED-0	02/23/06	08/24/07	Surface	REG	mg/kg	**23.8**	J-	1,400	J-	23.2	J-
Power House Wash:											
PHW-SED-01AS	11/17/05	11/22/05	Surface	REG	mg/kg	**35.7**	J	**6,030**		130	J
PHW-SED-02AS	11/17/05	11/22/05	Surface	REG	mg/kg	**43.3**		**7,700**		145	
PHW-SED-02BS	11/17/05	11/22/05	Subsurface	REG	mg/kg	**37.9**	J	**11,100**		140	J
PHW-SED-03AS	11/17/05	11/22/05	Surface	REG	mg/kg	**36.4**	J	**8,270**		110	J

TABLE 4-4
Soil Sampling Laboratory Values for Arsenic, Copper and Lead
ASARCO Concentrator, Crusher Facility and Smelter Site
Remedial Investigation Report
ASARCO LLC Hayden, Arizona Plant Site

The data in this table are illustrated on figures 4-2, 4-3, 4-4, 4-6, 4-7, 4-8, 4-12, 4-14, and 4-16.

Arizona Residential Soil Remediation Level[1] (mg/kg):						**10**		**3,100**		**400**	
EPA Region IX Preliminary Remediation Goal[2] (mg/kg):						**0.39**		**3,100**		**400**	
Location/	**Sample**	**Shipment**		**Sample**		**Arsenic**		**Copper**		**Lead**	
Parcel ID	**Date**	**Date**	**Depth**	**Type**	**Units**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**
PHW-SED-04AS	11/17/05	11/22/05	Surface	REG	mg/kg	**25.4**	J	**6,070**		104	J
PHW-SED-05AS	11/17/05	11/22/05	Surface	REG	mg/kg	**75.3**		**12,200**		239	
PHW-SED-05AS	11/17/05	11/22/05	Surface	FD	mg/kg	**77.4**		**12,100**		242	
PHW-SED-05BS	11/17/05	11/22/05	Subsurface	REG	mg/kg	**32.5**		**6,270**		105	
PHW-SED-06AS	11/17/05	11/22/05	Surface	REG	mg/kg	**36.1**		**8,810**		125	
PHW-SED-06BS	11/17/05	11/22/05	Subsurface	REG	mg/kg	**24**		**9,190**		78.6	
PHW-SED-07AS	11/17/05	11/22/05	Surface	REG	mg/kg	**43.5**		**9,030**		146	
PHW-SED-07BS	11/17/05	11/22/05	Subsurface	REG	mg/kg	**35.2**		**8,070**		110	
PHW-SED-08AS	11/18/05	11/22/05	Surface	REG	mg/kg	**16.5**		**4,650**		54	
PHW-SED-08BS	11/18/05	11/22/05	Subsurface	REG	mg/kg	**13.3**		**6,610**		42.7	
PHW-SED-09AS	11/18/05	11/22/05	Surface	REG	mg/kg	**21.5**		**8,510**		63.4	
PHW-SED-10AS	11/18/05	11/22/05	Surface	REG	mg/kg	**8.9**		2,380		31.9	
PHW-SED-10AS	11/18/05	11/22/05	Surface	FD	mg/kg	**10**		2,940		36.1	
PHW-SED-11AS	11/18/05	11/22/05	Surface	REG	mg/kg	**10.4**		**6,670**		14.3	
PHW-SED-12AS	11/18/05	11/22/05	Surface	REG	mg/kg	**4.6**		1,230		13.3	
PHW-SED-13AS	11/18/05	11/22/05	Surface	REG	mg/kg	**6.1**		2,270		15	
PHW-SED-14AS	11/18/05	11/22/05	Surface	REG	mg/kg	**7.9**		1,770		55.1	
PHW-SED-15AS	11/18/05	11/22/05	Surface	REG	mg/kg	**22**		**5,650**		86.9	
San Pedro Wash:											
SPW-SED-01AS	11/16/05	11/22/05	Surface	REG	mg/kg	**23.1**	J	**10,500**		51.5	J
SPW-SED-02AS	11/16/05	11/22/05	Surface	REG	mg/kg	**29.7**	J	**12,500**		67	J
SPW-SED-03AS	11/16/05	11/22/05	Surface	REG	mg/kg	**23.2**	J	**7,230**		118	J
SPW-SED-04AS	11/16/05	11/22/05	Surface	REG	mg/kg	**15.1**	J	**5,970**		30.9	J
SPW-SED-05AS	11/16/05	11/22/05	Surface	REG	mg/kg	**24.7**	J	**6,260**		89.7	J
SPW-SED-06AS	11/16/05	11/22/05	Surface	REG	mg/kg	**28.9**	J	**7,050**		129	J
SPW-SED-07AS	11/17/05	11/22/05	Surface	REG	mg/kg	**5.5**	J	926		24.1	J
SPW-SED-08AS	11/17/05	11/22/05	Surface	REG	mg/kg	**18.3**	J	**4,950**		90.4	J
SPW-SED-09AS	11/17/05	11/22/05	Surface	REG	mg/kg	**13**	J	**3,150**		57.8	J
SPW-SED-10AS	11/17/05	11/22/05	Surface	REG	mg/kg	**9**	J	2,440		45.4	J
SPW-SED-11AS	11/16/05	11/22/05	Surface	REG	mg/kg	**17.7**	J	2,860		62.6	J
SPW-SED-11AS	11/16/05	11/22/05	Surface	FD	mg/kg	**19**	J	3,050		64.6	J
SPW-SED-12AS	11/16/05	11/22/05	Surface	REG	mg/kg	**14.3**	J	**6,060**		35.6	J
SPW-SED-13AS	11/16/05	11/22/05	Surface	REG	mg/kg	**13.5**	J	**5,170**		65.3	J
SPW-SED-14AS	11/16/05	11/22/05	Surface	REG	mg/kg	**9.5**	J	2,230		38.6	J
SPW-SED-15AS	11/17/05	11/22/05	Surface	REG	mg/kg	**16.4**	J	**4,920**		60.8	J
SPW-SED-16AS	02/22/06	09/26/06	Surface	REG	mg/kg	**28**		**4,700**		17	
SPW-SED-16AS	02/22/06	08/24/07	Surface	REG	mg/kg	**11.1**		**5,160**		17.7	

TABLE 4-4
Soil Sampling Laboratory Values for Arsenic, Copper and Lead
ASARCO Concentrator, Crusher Facility and Smelter Site
Remedial Investigation Report
ASARCO LLC Hayden, Arizona Plant Site

The data in this table are illustrated on figures 4-2, 4-3, 4-4, 4-6, 4-7, 4-8, 4-12, 4-14, and 4-16.

Arizona Residential Soil Remediation Level[1] (mg/kg):						**10**		**3,100**		**400**	
EPA Region IX Preliminary Remediation Goal[2] (mg/kg):						**0.39**		**3,100**		**400**	
Location/	**Sample**	**Shipment**		**Sample**		**Arsenic**		**Copper**		**Lead**	
Parcel ID	**Date**	**Date**	**Depth**	**Type**	**Units**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**
SPW-SED-17AS	02/22/06	08/24/07	Surface	REG	mg/kg	**6.4**		**7,250**		12.0	
Kennecott Avenue Wash:											
KAW-01-SED-0	02/22/06	08/24/07	Surface	REG	mg/kg	**3.1**	J-	569	J-	9.6	J-
KAW-02-SED-0	02/22/06	02/24/06	Surface	REG	mg/kg	**1.6**		2,900		9.6	
KAW-03-SED-0	02/22/06	08/24/07	Surface	REG	mg/kg	**2.7**	J-	**3,920**	J-	7.3	J-
KAW-04-SED-0	02/22/06	08/24/07	Surface	REG	mg/kg	**4.4**	J-	1,840	J-	11.5	J-
KAW-05-SED-0	02/22/06	08/24/07	Surface	REG	mg/kg	**7.5**	J-	1,650	J-	31.3	J-
KAW-05-SED-0	02/22/06	08/24/07	Surface	FD	mg/kg	**6.8**	J-	1,750	J-	31.7	J-
KAW-06-SED-0	02/22/06	08/24/07	Surface	REG	mg/kg	**15.5**	J-	**4,720**	J-	81.5	J-
KAW-07-SED-0	02/22/06	08/24/07	Surface	REG	mg/kg	**2.6**	J-	567	J-	7.9	J-
KAW-08-SED-0	02/22/06	08/24/07	Surface	REG	mg/kg	**2.2**	J-	628	J-	5.3	J-
KAW-09-SED-0	02/23/06	08/24/07	Surface	REG	mg/kg	**21.6**	J-	**13,500**	J-	64.9	J-
KAW-10-SED-0	02/23/06	08/24/07	Surface	REG	mg/kg	**22.0**	J-	**9,620**	J-	97.7	J-

Table Notes:

[1] Arizona Department of Environmental Quality Residential Soil Remediation Levels, Title 18 Chapter 7, January 2008
[2] EPA Region IX Preliminary Remediation Goals, Residential Soil, October 2004
[3] Bold values with bold outline exceed one or more of the comparison criteria.
[4] Bold italicized values have detection limits above one or more of the comparison criteria.
[5] FD = Field duplicate
[6] J = Estimated value
[7] J+ = Estimated value, may be biased high
[8] J- = Estimated value, may be biased low
[9] mg/kg = milligrams per kilogram
[10] REG = Regular sample
[11] Subsurface = The sample was collected approximately 10-12 inches below surface.
[12] Surface = The sample was collected approximately 0-2 inches below surface.
[13] U = Not detected; reporting limit is shown in place of a result.
[14] UJ = Not detected; reporting limit is approximate and is shown in place of a result.

TABLE 4-5
Soil Sampling Laboratory Values for Arsenic, Copper and Lead
ASARCO Tailings Impoundments
Remedial Investigation Report
ASARCO LLC Hayden, Arizona Plant Site

The data in this table are illustrated on figures 4-9, 4-10, 4-11, 4-12, 4-14, and 4-16.

Arizona Residential Soil Remediation Level[1] (mg/kg):						**10**		**3,100**		**400**	
EPA Region IX Preliminary Remediation Goal[2] (mg/kg):						**0.39**		**3,100**		**400**	
Location/	**Sample**	**Shipment**		**Sample**		**Arsenic**		**Copper**		**Lead**	
Parcel ID	**Date**	**Date**	**Depth**	**Type**	**Units**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**
Tailing Pond AB/BC:											
TPA-01-SED-0	02/23/06	08/24/07	Surface	REG	mg/kg	**10.0**	J-	2,240	J-	19.0	J-
TPA-02-SED-0	02/23/06	08/24/07	Surface	REG	mg/kg	**8.6**	J-	1,450	J-	35.6	J-
TPA-03-SED-0	02/23/06	08/24/07	Surface	REG	mg/kg	**21.8**	J-	2,180	J-	80.0	J-
TPA-04-SED-0	02/23/06	08/24/07	Surface	REG	mg/kg	**24.5**	J-	2,770	J-	110	J-
TPA-05-SED-0	02/23/06	08/24/07	Surface	REG	mg/kg	**10.0**	J-	2,020	J-	19.9	J-
TPA-05-SED-0	02/23/06	08/24/07	Surface	FD	mg/kg	**11.9**	J-	2,770	J-	14.1	J-
TPA-06-SED-0	02/23/06	08/24/07	Surface	REG	mg/kg	**4.8**	J-	**3,730**	J-	8.2	J-
TPA-07-SED-0	02/23/06	02/24/06	Surface	REG	mg/kg	**13.7**		1,990		60	J
TPA-08-SED-0	02/23/06	08/24/07	Surface	REG	mg/kg	**27.3**	J-	2,360	J-	97.3	J-
Tailings Pond D:											
TPD-01-SED-0	02/23/06	08/24/07	Surface	REG	mg/kg	**11.6**	J-	2,250	J-	49.4	J-
TPD-02-SED-0	02/23/06	08/24/07	Surface	REG	mg/kg	**10.0**	J-	**3,920**	J-	24.9	J-
TPD-03-SED-0	02/23/06	08/24/07	Surface	REG	mg/kg	**10.1**	J-	2,680	J-	39.8	J-
TPD-04-SED-0	02/23/06	08/24/07	Surface	REG	mg/kg	**18.1**	J-	**6,000**	J-	59.2	J-

Table Notes:

[1] Arizona Department of Environmental Quality Residential Soil Remediation Levels, Title 18 Chapter 7, January 2008

[2] EPA Region IX Preliminary Remediation Goals, Residential Soil, October 2004

[3] Bold values with bold outline exceed one or more of the comparison criteria.

[4] FD = Field duplicate

[5] J = Estimated value

[6] J- = Estimated value, may be biased low

[7] mg/kg = milligrams per kilogram

[8] REG = Regular sample

[9] Surface = The sample was collected approximately 0-2 inches below surface.

TABLE 4-6
Soil Sampling Laboratory Values for Arsenic, Copper and Lead
Public and Upland Areas
Remedial Investigation Report
ASARCO LLC Hayden, Arizona Plant Site

The data in this table are illustrated on figures 4-2, 4-3, 4-4, 4-6, 4-7, 4-8, 4-9, 4-10, 4-11, 4-12, 4-14, 4-16, 4-18, 4-20, and 4-22.

Arizona Residential Soil Remediation Level[1] (mg/kg):						**10**		**3,100**		**400**	
EPA Region IX Preliminary Remediation Goal[2] (mg/kg):						**0.39**		**3,100**		**400**	
Location/	**Sample**	**Shipment**		**Sample**		**Arsenic**		**Copper**		**Lead**	
Parcel ID	**Date**	**Date**	**Depth**	**Type**	**Units**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**
Hayden Golf Club:											
HGC-01-SED-0	02/20/06	08/22/07	Surface	REG	mg/kg	**4.2**	J-	389	J-	24.6	J-
HGC-02-SED-0	02/20/06	08/22/07	Surface	REG	mg/kg	**3.7**	J-	126	J-	10.8	J-
HGC-03-SED-0	02/20/06	08/22/07	Surface	REG	mg/kg	**3.0**	J-	74.4	J-	7.5	J-
HGC-03-SED-0	02/20/06	08/22/07	Surface	FD	mg/kg	**3.2**	J-	87.3	J-	9.1	J-
HGC-04-SED-0	02/20/06	08/22/07	Surface	REG	mg/kg	**3.0**	J-	233	J-	21.9	J-
HGC-05-SED-0	02/20/06	08/22/07	Surface	REG	mg/kg	**10.6**	J-	234	J-	49.0	J-
HGC-06-SED-0	02/20/06	08/22/07	Surface	REG	mg/kg	**5.6**	J-	332	J-	24.2	J-
HGC-07-SED-0	02/20/06	08/22/07	Surface	REG	mg/kg	**7.1**	J-	275	J-	20.6	J-
HGC-08-SED-0	02/20/06	08/22/07	Surface	REG	mg/kg	**6.0**	J-	390	J-	37.2	J-
HGC-09-SED-0	02/20/06	08/22/07	Surface	REG	mg/kg	**5.4**	J-	314	J-	25.1	J-
HGC-10-SED-0	02/20/06	02/24/06	Surface	REG	mg/kg	**3.7**	J	391		19.8	J
HGC-10-SED-0	02/20/06	09/14/07	Surface	REG	mg/kg	**4.7**	J-	381	J-	21.4	J-
HGC-11-SED-0	02/20/06	08/22/07	Surface	REG	mg/kg	**3.2**	J-	298	J-	13.0	J-
HGC-11-SED-0	02/20/06	08/22/07	Surface	FD	mg/kg	**4.9**	J-	274	J-	13.0	J-
HGC-12-SED-0	02/20/06	08/22/07	Surface	REG	mg/kg	**2.6**	J-	160	J-	11.8	J-
HGC-13-SED-0	02/20/06	08/22/07	Surface	REG	mg/kg	**7.9**	J-	236	J-	26.2	J-
HGC-14-SED-0	02/20/06	08/22/07	Surface	REG	mg/kg	**3.9**	J-	150	J-	7.2	J-
HGC-15-SED-0	02/20/06	08/22/07	Surface	REG	mg/kg	**9.8**	J-	212	J-	27.1	J-
HGC-16-SED-0	02/20/06	08/22/07	Surface	REG	mg/kg	**7.9**	J-	248	J-	24.9	J-
HGC-17-SED-0	02/20/06	08/22/07	Surface	REG	mg/kg	**4.8**	J-	466	J-	26.0	J-
HGC-18-SED-0	02/20/06	08/22/07	Surface	REG	mg/kg	**4.5**	J-	650	J-	31.6	J-
HGC-19-SED-0	02/20/06	08/22/07	Surface	REG	mg/kg	**6.1**	J-	883	J-	27.6	J-
HGC-19-SED-0	02/20/06	08/22/07	Surface	FD	mg/kg	**6.9**	J-	954	J-	29.0	J-
HGC-20-SED-0	02/20/06	02/24/06	Surface	REG	mg/kg	**1.3**	J	154		6.6	J
HGC-21-SED-0	02/20/06	08/22/07	Surface	REG	mg/kg	**3.6**	J-	368	J-	21.4	J-
HGC-22-SED-0	02/20/06	08/22/07	Surface	REG	mg/kg	**7.4**	J-	**14,700**	J-	26.4	J-
HGC-23-SED-0	02/21/06	08/22/07	Surface	REG	mg/kg	**7.7**	J-	1,000	J-	34.8	J-
HGC-24-SED-0	02/21/06	08/22/07	Surface	REG	mg/kg	**18.8**	J-	1,570	J-	64.1	J-
HGC-24-SED-0	02/21/06	08/22/07	Surface	FD	mg/kg	**24.8**	J-	1,560	J-	74.5	J-
HGC-25-SED-0	02/21/06	08/22/07	Surface	REG	mg/kg	**42.6**	J-	**4,210**	J-	104	J-
HGC-26-SED-0	02/21/06	08/22/07	Surface	REG	mg/kg	**18.1**	J-	**3,390**	J-	85.4	J-
HGC-27-SED-0	02/21/06	08/22/07	Surface	REG	mg/kg	**15.8**	J-	2,620	J-	54.7	J-
HGC-28-SED-0	02/21/06	08/22/07	Surface	REG	mg/kg	**34.1**	J-	**4,890**	J-	130	J-
HGC-29-SED-0	02/21/06	08/22/07	Surface	REG	mg/kg	**60.4**	J-	**8,460**	J-	227	J-
HGC-30-SED-0	02/21/06	02/24/06	Surface	REG	mg/kg	**81.1**	J	**9,320**		191	J
HGC-30-SED-0	02/21/06	09/14/07	Surface	REG	mg/kg	**87.8**	J-	**9,210**	J-	193	J-
HGC-30-SED-1	02/21/06	08/22/07	Subsurface	REG	mg/kg	**6.5**	J-	324	J-	15.7	J-

TABLE 4-6
Soil Sampling Laboratory Values for Arsenic, Copper and Lead
Public and Upland Areas
Remedial Investigation Report
ASARCO LLC Hayden, Arizona Plant Site

The data in this table are illustrated on figures 4-2, 4-3, 4-4, 4-6, 4-7, 4-8, 4-9, 4-10, 4-11, 4-12, 4-14, 4-16, 4-18, 4-20, and 4-22.

Arizona Residential Soil Remediation Level[1] (mg/kg):						**10**		**3,100**		**400**	
EPA Region IX Preliminary Remediation Goal[2] (mg/kg):						**0.39**		**3,100**		**400**	
Location/	**Sample**	**Shipment**		**Sample**		**Arsenic**		**Copper**		**Lead**	
Parcel ID	**Date**	**Date**	**Depth**	**Type**	**Units**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**
HGC-31-SED-0	02/21/06	08/22/07	Surface	REG	mg/kg	**13.9**	J-	**4,040**	J-	34.0	J-
HGC-32-SED-0	02/21/06	08/22/07	Surface	REG	mg/kg	**6.4**	J-	692	J-	20.0	J-
HGC-33-SED-0	02/21/06	02/24/06	Surface	REG	mg/kg	**13.2**	J	1,600		53.4	J
Hayden Public Areas:											
HPUB-01-SED-0	02/24/06	02/24/06	Surface	REG	mg/kg	**40.7**		**22,400**		204	J
HPUB-01-SED-0	02/24/06	09/14/07	Surface	REG	mg/kg	**60.9**	J-	**24,400**	J-	209	J-
HPUB-01-SED-1	02/24/06	08/24/07	Subsurface	REG	mg/kg	**26.4**	J-	3,010	J-	89.5	J-
HPUB-02-SED-0	02/24/06	08/24/07	Surface	REG	mg/kg	**50.0**	J-	**19,000**	J-	156	J-
HPUB-02-SED-1	02/24/06	02/24/06	Subsurface	REG	mg/kg	**3.7**		42.6		47.5	J
HPUB-03-SED-1	02/24/06	08/24/07	Subsurface	REG	mg/kg	**19.8**	J-	**3,940**	J-	80.5	J-
HPUB-04-SED-0	02/24/06	08/24/07	Surface	REG	mg/kg	**25.7**	J-	**6,880**	J-	62.6	J-
HPUB-04-SED-1	02/24/06	08/24/07	Subsurface	REG	mg/kg	**9.6**	J-	2,480	J-	41.0	J-
HPUB-04-SED-1	02/24/06	08/24/07	Subsurface	FD	mg/kg	**10.0**	J-	2,250	J-	35.6	J-
HPUB-05-SED-0	02/24/06	08/24/07	Surface	REG	mg/kg	**5.5**	J-	1,460	J-	16.8	J-
HPUB-05-SED-1	02/24/06	08/24/07	Subsurface	REG	mg/kg	**3.9**	J-	716	J-	12.9	J-
HPUB-06-SED-0	02/24/06	08/24/07	Surface	REG	mg/kg	**10.0**	J-	2,210	J-	31.2	J-
HPUB-06-SED-1	02/24/06	08/24/07	Subsurface	REG	mg/kg	**8.6**	J-	1,560	J-	41.6	J-
HPUB-07-SED-0	02/24/06	08/24/07	Surface	REG	mg/kg	**16.5**	J-	**7,770**	J-	98.2	J-
HPUB-07-SED-1	02/24/06	08/24/07	Subsurface	REG	mg/kg	**8.0**	J-	1,550	J-	43.1	J-
HPUB-07-SED-1	02/24/06	08/24/07	Subsurface	FD	mg/kg	**8.7**	J-	1,600	J-	40.7	J-
HPUB-08-SED-0	02/24/06	08/24/07	Surface	REG	mg/kg	**6.2**	J-	2,590	J-	37.7	J-
HPUB-08-SED-1	02/24/06	08/24/07	Subsurface	REG	mg/kg	**9.2**	J-	2,070	J-	65.8	J-
HPUB-09-SED-0	02/24/06	08/24/07	Surface	REG	mg/kg	**9.4**	J-	**3,410**	J-	40.6	J-
HPUB-09-SED-1	02/24/06	08/24/07	Subsurface	REG	mg/kg	**8.5**	J-	**3,170**	J-	41.3	J-
HPUB-10-SED-0	02/24/06	08/24/07	Surface	REG	mg/kg	**20.0**	J-	**8,100**	J-	58.3	J-
HPUB-10-SED-1	02/24/06	08/24/07	Subsurface	REG	mg/kg	**16.7**	J-	**8,210**	J-	39.1	J-
State Route 77:											
SR77-01-SED-0	02/21/06	02/24/06	Surface	REG	mg/kg	**39.1**	J+	**8,130**		231	J
SR77-01-SED-0.3	02/21/06	08/24/07	Subsurface	REG	mg/kg	**18.0**	J-	622	J-	20.6	J-
SR77-02-SED-0	02/21/06	08/24/07	Surface	REG	mg/kg	**10.0**	J-	1,290	J-	32.6	J-
SR77-02-SED-0.3	02/21/06	08/24/07	Subsurface	REG	mg/kg	**26.6**	J-	2,820	J-	101	J-
SR77-02-SED-0.3	02/21/06	08/24/07	Subsurface	FD	mg/kg	**31.4**	J-	**3,110**	J-	114	J-
SR77-03-SED-0	02/21/06	08/24/07	Surface	REG	mg/kg	**29.7**	J-	**3,490**	J-	72.6	J-
SR77-03-SED-0.3	02/21/06	08/24/07	Subsurface	REG	mg/kg	**26.2**	J-	2,860	J-	73.8	J-
Upland Areas/Background:											
UP-01-SED-0	02/21/06	02/24/06	Surface	REG	mg/kg	**10.9**	J+	1,540		41.1	J
UP-01-SED-1	02/21/06	08/24/07	Subsurface	REG	mg/kg	**13.2**	J-	1,640	J-	45.2	J-
UP-02-SED-0	02/23/06	08/24/07	Surface	REG	mg/kg	**70.0**	J-	**10,200**	J-	247	J-

TABLE 4-6
Soil Sampling Laboratory Values for Arsenic, Copper and Lead
Public and Upland Areas
Remedial Investigation Report
ASARCO LLC Hayden, Arizona Plant Site

The data in this table are illustrated on figures 4-2, 4-3, 4-4, 4-6, 4-7, 4-8, 4-9, 4-10, 4-11, 4-12, 4-14, 4-16, 4-18, 4-20, and 4-22.

Arizona Residential Soil Remediation Level[1] (mg/kg):						**10**		**3,100**		**400**	
EPA Region IX Preliminary Remediation Goal[2] (mg/kg):						**0.39**		**3,100**		**400**	
Location/	**Sample**	**Shipment**		**Sample**		**Arsenic**		**Copper**		**Lead**	
Parcel ID	**Date**	**Date**	**Depth**	**Type**	**Units**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**
UP-02-SED-1	02/23/06	08/24/07	Subsurface	REG	mg/kg	**31.3**	J-	**3,240**	J-	88.5	J-
UP-02-SED-1	02/23/06	08/24/07	Subsurface	FD	mg/kg	**28.3**	J-	**3,620**	J-	94.8	J-
UP-03-SED-0	02/23/06	08/24/07	Surface	REG	mg/kg	**3.5**	J-	220	J-	17.2	J-
UP-03-SED-1	02/23/06	08/24/07	Subsurface	REG	mg/kg	**2.5**	J-	69.4	J-	9.8	J-
UPA-01-SED-0	02/22/06	02/24/06	Surface	REG	mg/kg	**6.7**	J	854		36.3	J
UPA-01-SED-0.5	02/22/06	08/24/07	Subsurface	REG	mg/kg	**3.7**	J-	269	J-	13.1	J-
UPA-02-SED-0	02/22/06	08/24/07	Surface	REG	mg/kg	**5.8**	J-	983	J-	46.7	J-
UPA-02-SED-0.66	02/22/06	08/24/07	Subsurface	REG	mg/kg	**4.6**	J-	210	J-	17.5	J-
UPA-03-SED-0	02/22/06	08/24/07	Surface	REG	mg/kg	**5.7**	J-	505	J-	18.0	J-
UPA-03-SED-10	02/22/06	08/24/07	Subsurface	REG	mg/kg	**6.0**	J-	49.5	J-	14.2	J-
UPA-04-SED-0	02/22/06	08/24/07	Surface	REG	mg/kg	**4.6**	J-	423	J-	19.4	J-
UPA-04-SED-0	02/22/06	08/24/07	Surface	FD	mg/kg	**6.0**	J-	501	J-	23.8	J-
UPA-04-SED-1	02/22/06	02/24/06	Subsurface	REG	mg/kg	**1.8**		16.6		5.1	
UPA-04-SED-1	02/22/06	02/24/06	Subsurface	FD	mg/kg	**2.2**		16.9		5.5	
UPA-05-SED-0	02/22/06	08/24/07	Surface	REG	mg/kg	**8.2**	J-	765	J-	28.3	J-
UPA-05-SED-0.66	02/22/06	08/24/07	Subsurface	REG	mg/kg	**3.1**	J-	110	J-	9.5	J-
UPA-06-SED-0	02/22/06	08/24/07	Surface	REG	mg/kg	**7.4**	J-	614	J-	31.2	J-
UPA-06-SED-10.66	02/22/06	08/24/07	Subsurface	REG	mg/kg	**3.2**	J-	77.1	J-	9.3	J-
UPA-07-SED-0	02/22/06	02/24/06	Surface	REG	mg/kg	**9.1**	J	882		41.1	J
UPA-07-SED-0.66	02/22/06	08/24/07	Subsurface	REG	mg/kg	**4.3**	J-	262	J-	18.4	J-
UPA-08-SED-0	02/22/06	08/28/07	Surface	REG	mg/kg	**27.2**	J-	**6,310**	J-	143	J-
UPA-08-SED-0.5	02/22/06	08/28/07	Subsurface	REG	mg/kg	**9.4**	J-	1,540	J-	38.1	J-
UPA-09-SED-0	02/22/06	08/28/07	Surface	REG	mg/kg	**12.5**	J-	**3,250**	J-	84.4	J-
UPA-09-SED-0.5	02/22/06	08/28/07	Subsurface	REG	mg/kg	**8.3**	J-	809	J-	28.1	J-
Winkelman School Complex:											
WSC-01-SED-0	02/20/06	08/24/07	Surface	REG	mg/kg	**14.9**		1,170		35.1	
WSC-01-SED-0	02/20/06	08/24/07	Surface	FD	mg/kg	**13.4**		1,080		35.5	
WSC-02-SED-0	02/20/06	08/24/07	Surface	REG	mg/kg	**3.4**		727		19.3	
WSC-03-SED-0	02/20/06	08/24/07	Surface	REG	mg/kg	**4.7**		730		29.8	
WSC-04-SED-0	02/20/06	08/24/07	Surface	REG	mg/kg	**4.5**		392		16.0	
WSC-05-SED-0	02/20/06	08/24/07	Surface	REG	mg/kg	**6.8**		876		20.6	
WSC-06-SED-0	02/20/06	08/24/07	Surface	REG	mg/kg	**7.4**		1,210		42.5	
WSC-07-SED-0	02/20/06	08/24/07	Surface	REG	mg/kg	**5.8**		216		25.2	
WSC-08-SED-0	02/21/06	02/24/06	Surface	REG	mg/kg	**2.1**	J	38.4		7	J
WSC-09-SED-0	02/21/06	08/24/07	Surface	REG	mg/kg	**3.0**		77.8		9.0	
WSC-10-SED-0	02/21/06	08/24/07	Surface	REG	mg/kg	**2.5**		58.2		8.0	
WSC-10-SED-0	02/21/06	08/24/07	Surface	FD	mg/kg	**3.6**		62.3		8.2	
WSC-11-SED-0	02/21/06	08/24/07	Surface	REG	mg/kg	**3.5**		58.0		7.3	

TABLE 4-6
Soil Sampling Laboratory Values for Arsenic, Copper and Lead
Public and Upland Areas
Remedial Investigation Report
ASARCO LLC Hayden, Arizona Plant Site

The data in this table are illustrated on figures 4-2, 4-3, 4-4, 4-6, 4-7, 4-8, 4-9, 4-10, 4-11, 4-12, 4-14, 4-16, 4-18, 4-20, and 4-22.

Arizona Residential Soil Remediation Level[1] (mg/kg):						**10**		**3,100**		**400**	
EPA Region IX Preliminary Remediation Goal[2] (mg/kg):						**0.39**		**3,100**		**400**	
Location/	**Sample**	**Shipment**		**Sample**		**Arsenic**		**Copper**		**Lead**	
Parcel ID	**Date**	**Date**	**Depth**	**Type**	**Units**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**
WSC-12-SED-0	02/21/06	08/24/07	Surface	REG	mg/kg	**2.3**		306		20.3	
WSC-13-SED-0	02/21/06	08/24/07	Surface	REG	mg/kg	**4.1**		311		22.1	
WSC-14-SED-0	02/21/06	08/24/07	Surface	REG	mg/kg	**4.5**		198		13.6	
WSC-15-SED-0	02/21/06	08/24/07	Surface	REG	mg/kg	**3.1**		62.1		6.5	
WSC-16-SED-0	02/21/06	08/24/07	Surface	REG	mg/kg	**2.8**		20.0		3.4	
WSC-17-SED-0	02/21/06	08/24/07	Surface	REG	mg/kg	**3.2**		60.5		6.4	
WSC-18-SED-0	02/21/06	02/24/06	Surface	REG	mg/kg	**2.3**	J	65.8		10.4	J
WSC-18-SED-0	02/21/06	09/14/07	Surface	REG	mg/kg	**3.4**	J-	132	J-	13.3	J-
WSC-19-SED-0	02/21/06	08/24/07	Surface	REG	mg/kg	**2.0**	J-	45.7	J-	12.0	J-
WSC-20-SED-0	02/21/06	08/24/07	Surface	REG	mg/kg	**1.3**	J-	42.6	J-	8.9	J-
WSC-20-SED-0	02/21/06	08/24/07	Surface	FD	mg/kg	**2.3**	J-	74.9	J-	12.5	J-
WSC-21-SED-0	02/21/06	08/24/07	Surface	REG	mg/kg	**5.8**	J-	538	J-	30.9	J-
WSC-22-SED-0	02/21/06	08/24/07	Surface	REG	mg/kg	**6.0**	J-	497	J-	21.5	J-
WSC-23-SED-0	02/21/06	08/24/07	Surface	REG	mg/kg	**2.0**	J-	44.9	J-	9.6	J-
WSC-24-SED-0	02/21/06	08/24/07	Surface	REG	mg/kg	**5.1**	J-	502	J-	29.6	J-
WSC-25-SED-0	02/23/06	08/24/07	Surface	REG	mg/kg	**5.0**	J-	612	J-	28.7	J-
WSC-26-SED-0	02/23/06	08/24/07	Surface	REG	mg/kg	**6.3**	J-	267	J-	26.9	J-
WSC-27-SED-0	02/23/06	08/24/07	Surface	REG	mg/kg	**3.5**	J-	430	J-	23.3	J-
WSC-28-SED-0	02/23/06	08/24/07	Surface	REG	mg/kg	**4.7**	J-	469	J-	26.2	J-
WSC-29-SED-0	02/23/06	08/28/07	Surface	REG	mg/kg	**7.8**	J-	964	J-	35.9	J-
WSC-29-SED-0	02/23/06	08/28/07	Surface	FD	mg/kg	**5.4**	J-	820	J-	32.3	J-
WSC-30-SED-0	02/23/06	08/28/07	Surface	REG	mg/kg	**4.0**	J-	259	J-	14.7	J-
WSC-31-SED-0	02/23/06	02/24/06	Surface	REG	mg/kg	**4**		454		23.2	
WSC-32-SED-0	02/23/06	08/28/07	Surface	REG	mg/kg	**5.2**	J-	405	J-	22.8	J-
WSC-33-SED-0	02/23/06	08/28/07	Surface	REG	mg/kg	**4.7**	J-	264	J-	11.3	J-
WSC-34-SED-0	02/23/06	08/28/07	Surface	REG	mg/kg	**3.0**	J-	113	J-	6.1	J-
WSC-35-SED-0	02/23/06	08/28/07	Surface	REG	mg/kg	**4.3**	J-	282	J-	20.8	J-
WSC-36-SED-0	02/23/06	08/28/07	Surface	REG	mg/kg	**1.9**	J-	229	J-	12.0	J-
WSC-37-SED-0	02/23/06	08/28/07	Surface	REG	mg/kg	**3.4**	J-	116	J-	17.2	J-
WSC-38-SED-0	02/23/06	08/28/07	Surface	REG	mg/kg	**5.6**	J-	653	J-	48.2	J-
Winkelman School Housing Area A:											
WSCLA-01-SED-0	02/24/06	02/24/06	Surface	REG	mg/kg	**5.3**		448		25.1	J
WSCLA-03-SED-0	02/24/06	08/28/07	Surface	REG	mg/kg	**7.8**	J-	568	J-	47.9	J-
WSCLA-04-SED-0	02/24/06	08/28/07	Surface	REG	mg/kg	**9.1**	J-	489	J-	31.2	J-
WSCLA-04-SED-0	02/24/06	08/28/07	Surface	FD	mg/kg	**7.5**	J-	495	J-	31.3	J-
WSCLA-05-SED-0	02/24/06	08/28/07	Surface	REG	mg/kg	**10.3**	J-	2,480	J-	84.5	J-
WSCLA-07-SED-0	02/24/06	08/28/07	Surface	REG	mg/kg	**8.3**	J-	2,670	J-	91.4	J-
WSCLA-08-SED-0	02/24/06	08/28/07	Surface	REG	mg/kg	**4.3**	J-	193	J-	24.2	J-

TABLE 4-6
Soil Sampling Laboratory Values for Arsenic, Copper and Lead
Public and Upland Areas
Remedial Investigation Report
ASARCO LLC Hayden, Arizona Plant Site

The data in this table are illustrated on figures 4-2, 4-3, 4-4, 4-6, 4-7, 4-8, 4-9, 4-10, 4-11, 4-12, 4-14, 4-16, 4-18, 4-20, and 4-22.

Arizona Residential Soil Remediation Level[1] (mg/kg):						**10**		**3,100**		**400**	
EPA Region IX Preliminary Remediation Goal[2] (mg/kg):						**0.39**		**3,100**		**400**	
Location/	**Sample**	**Shipment**		**Sample**		**Arsenic**		**Copper**		**Lead**	
Parcel ID	**Date**	**Date**	**Depth**	**Type**	**Units**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**
WSCLA-09-SED-0	02/24/06	08/28/07	Surface	REG	mg/kg	**9.7**	J-	205	J-	24.7	J-
WSCLA-09-SED-1	02/24/06	08/28/07	Subsurface	REG	mg/kg	**5.5**	J-	49.3	J-	16.5	J-
Winkelman School Housing Area B:											
WSCLB-01-SED-0	02/24/06	08/28/07	Surface	REG	mg/kg	**7.5**	J-	144	J-	23.6	J-
WSCLB-01-SED-0	02/24/06	08/28/07	Surface	FD	mg/kg	**6.4**	J-	126	J-	21.4	J-
WSCLB-02-SED-0	02/24/06	02/24/06	Surface	REG	mg/kg	**3.8**		369		23.3	J
WSCLB-02-SED-1	02/24/06	08/28/07	Subsurface	REG	mg/kg	**6.3**	J-	85.2	J-	18.4	J-
WSCLB-03-SED-0	02/24/06	08/28/07	Surface	REG	mg/kg	**5.2**	J-	302	J-	24.9	J-
WSCLB-04-SED-0	02/24/06	08/28/07	Surface	REG	mg/kg	**7.2**	J-	113	J-	21.1	J-
WSCLB-05-SED-0	02/24/06	08/28/07	Surface	REG	mg/kg	**5.3**	J-	542	J-	30.1	J-
WSCLB-06-SED-0	02/24/06	08/28/07	Surface	REG	mg/kg	**6.5**	J-	1,380	J-	38.7	J-
WSCLB-07-SED-0	02/24/06	08/28/07	Surface	REG	mg/kg	**6.5**	J-	1,270	J-	38.0	J-
WSCLB-08-SED-0	02/24/06	08/28/07	Surface	REG	mg/kg	**6.1**	J-	668	J-	27.0	J-
WSCLB-09-SED-0	02/24/06	08/28/07	Surface	REG	mg/kg	**3.5**	J-	715	J-	29.3	J-
Winkelman School Housing Area C:											
WSCLC-01-SED-0	02/24/06	08/28/07	Surface	REG	mg/kg	**3.5**	J-	350	J-	19.4	J-
WSCLC-01-SED-0	02/24/06	08/28/07	Surface	FD	mg/kg	**5.8**	J-	326	J-	19.7	J-
WSCLC-02-SED-0	02/24/06	08/28/07	Surface	REG	mg/kg	**4.2**	J-	501	J-	19.6	J-
WSCLC-03-SED-0	02/24/06	02/24/06	Surface	REG	mg/kg	**1.9**		181		24.3	J
WSCLC-04-SED-0	02/24/06	08/28/07	Surface	REG	mg/kg	**4.4**	J-	174	J-	15.8	J-
WSCLC-05-SED-0	02/24/06	08/28/07	Surface	REG	mg/kg	**6.2**	J-	203	J-	14.8	J-
WSCLC-05-SED-1	02/24/06	08/28/07	Subsurface	REG	mg/kg	**2.8**	J-	71.6	J-	11.9	J-
WSCLC-06-SED-0	02/24/06	08/28/07	Surface	REG	mg/kg	**2.6**	J-	64.3	J-	9.6	J-
WSCLC-07-SED-0	02/24/06	08/28/07	Surface	REG	mg/kg	**6.9**	J-	930	J-	37.0	J-
WSCLC-08-SED-0	02/24/06	08/28/07	Surface	REG	mg/kg	**5.0**	J-	418	J-	20.6	J-
WSCLC-09-SED-0	02/24/06	08/28/07	Surface	REG	mg/kg	**5.0**	J-	659	J-	30.7	J-

Table Notes:

[1] Arizona Department of Environmental Quality Residential Soil Remediation Levels, Title 18 Chapter 7, January 2008

[2] EPA Region IX Preliminary Remediation Goals, Residential Soil, October 2004

[3] Bold values with bold outline exceed one or more of the comparison criteria.

[4] FD = Field duplicate

[5] J = Estimated value

[6] J+ = Estimated value, may be biased high

[7] J- = Estimated value, may be biased low

[8] mg/kg = milligrams per kilogram

[9] REG = Regular sample

[10] Subsurface = The sample was collected approximately 10-12 inches below surface.

[11] Surface = The sample was collected approximately 0-2 inches below surface.

TABLE 4-7
Soil Sampling Laboratory Value Exceedances for Full Inorganic Target Analyte List
Non-Residential Properties
Remedial Investigation Report
ASARCO LLC Hayden, Arizona Plant Site

The data in this table are illustrated on figures 4-2, 4-3, 4-4, 4-5, 4-6, 4-7, 4-8, 4-9, 4-10, 4-11, 4-12, 4-14, and 4-16.

Arizona Residential Soil Remediation Level[1] (mg/kg):						**31**		**10**		**39**		**3,100**		**--**		**400**		**390**		**5.2**		**78**	
EPA Region IX Preliminary Remediation Goal[2] (mg/kg):						**31**		**0.39**		**37**		**3,100**		**23,000**		**400**		**390**		**5.2**		**78**	
Location/	**Sample**	**Shipment**		**Sample**		**Antimony**		**Arsenic**		**Cadmium**		**Copper**		**Iron**		**Lead**		**Molybdenum**		**Thallium**		**Vanadium**	
Parcel ID	**Date**	**Date**	**Depth**	**Type**	**Units**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**
Crusher Facility:																							
CF-01-SED-0	02/22/06	08/22/07	Surface	REG	mg/kg	NA		**27.6**	J-	NA		**12,000**	J-	NA		56.9	J-	NA		NA		NA	
CF-02-SED-0	02/22/06	08/22/07	Surface	REG	mg/kg	NA		**45.8**	J-	NA		**23,300**	J-	NA		95.1	J-	NA		NA		NA	
CF-03-SED-0	02/22/06	08/22/07	Surface	REG	mg/kg	NA		**31.6**	J-	NA		**29,000**	J-	NA		45.2	J-	NA		NA		NA	
CF-04-SED-0	02/22/06	08/22/07	Surface	REG	mg/kg	NA		**42.4**	J-	NA		**57,600**	J-	NA		102	J-	NA		NA		NA	
CF-05-SED-0	02/22/06	08/22/07	Surface	REG	mg/kg	NA		**1.9**	J-	NA		390	J-	NA		3.5	J-	NA		NA		NA	
CF-06-SED-0	02/22/06	08/22/07	Surface	REG	mg/kg	NA		**33.0**	J-	NA		**131,000**	J-	NA		48.4	J-	NA		NA		NA	
CF-07-SED-0	02/22/06	08/22/07	Surface	REG	mg/kg	NA		**52.7**	J-	NA		**21,200**	J-	NA		156	J-	NA		NA		NA	
Hayden Golf Club:																							
HGC-01-SED-0	02/20/06	08/22/07	Surface	REG	mg/kg	NA		**4.2**	J-	NA		389	J-	NA		24.6	J-	NA		NA		NA	
HGC-02-SED-0	02/20/06	08/22/07	Surface	REG	mg/kg	NA		**3.7**	J-	NA		126	J-	NA		10.8	J-	NA		NA		NA	
HGC-03-SED-0	02/20/06	08/22/07	Surface	REG	mg/kg	NA		**3.0**	J-	NA		74.4	J-	NA		7.5	J-	NA		NA		NA	
HGC-03-SED-0	02/20/06	08/22/07	Surface	FD	mg/kg	NA		**3.2**	J-	NA		87.3	J-	NA		9.1	J-	NA		NA		NA	
HGC-04-SED-0	02/20/06	08/22/07	Surface	REG	mg/kg	NA		**3.0**	J-	NA		233	J-	NA		21.9	J-	NA		NA		NA	
HGC-05-SED-0	02/20/06	08/22/07	Surface	REG	mg/kg	NA		**10.6**	J-	NA		234	J-	NA		49.0	J-	NA		NA		NA	
HGC-06-SED-0	02/20/06	08/22/07	Surface	REG	mg/kg	NA		**5.6**	J-	NA		332	J-	NA		24.2	J-	NA		NA		NA	
HGC-07-SED-0	02/20/06	08/22/07	Surface	REG	mg/kg	NA		**7.1**	J-	NA		275	J-	NA		20.6	J-	NA		NA		NA	
HGC-08-SED-0	02/20/06	08/22/07	Surface	REG	mg/kg	NA		**6.0**	J-	NA		390	J-	NA		37.2	J-	NA		NA		NA	
HGC-09-SED-0	02/20/06	08/22/07	Surface	REG	mg/kg	NA		**5.4**	J-	NA		314	J-	NA		25.1	J-	NA		NA		NA	
HGC-10-SED-0	02/20/06	02/24/06	Surface	REG	mg/kg	0.8	J	**3.7**	J	0.52	J+	391		17,300	J	19.8	J	7	J	0.71	UJ	32.6	J
HGC-10-SED-0	02/20/06	09/14/07	Surface	REG	mg/kg	NA		**4.7**	J-	NA		381	J-	NA		21.4	J-	NA		NA		NA	
HGC-11-SED-0	02/20/06	08/22/07	Surface	REG	mg/kg	NA		**3.2**	J-	NA		298	J-	NA		13.0	J-	NA		NA		NA	
HGC-11-SED-0	02/20/06	08/22/07	Surface	FD	mg/kg	NA		**4.9**	J-	NA		274	J-	NA		13.0	J-	NA		NA		NA	
HGC-12-SED-0	02/20/06	08/22/07	Surface	REG	mg/kg	NA		**2.6**	J-	NA		160	J-	NA		11.8	J-	NA		NA		NA	
HGC-13-SED-0	02/20/06	08/22/07	Surface	REG	mg/kg	NA		**7.9**	J-	NA		236	J-	NA		26.2	J-	NA		NA		NA	
HGC-14-SED-0	02/20/06	08/22/07	Surface	REG	mg/kg	NA		**3.9**	J-	NA		150	J-	NA		7.2	J-	NA		NA		NA	
HGC-15-SED-0	02/20/06	08/22/07	Surface	REG	mg/kg	NA		**9.8**	J-	NA		212	J-	NA		27.1	J-	NA		NA		NA	
HGC-16-SED-0	02/20/06	08/22/07	Surface	REG	mg/kg	NA		**7.9**	J-	NA		248	J-	NA		24.9	J-	NA		NA		NA	
HGC-17-SED-0	02/20/06	08/22/07	Surface	REG	mg/kg	NA		**4.8**	J-	NA		466	J-	NA		26.0	J-	NA		NA		NA	
HGC-18-SED-0	02/20/06	08/22/07	Surface	REG	mg/kg	NA		**4.5**	J-	NA		650	J-	NA		31.6	J-	NA		NA		NA	
HGC-19-SED-0	02/20/06	08/22/07	Surface	REG	mg/kg	NA		**6.1**	J-	NA		883	J-	NA		27.6	J-	NA		NA		NA	
HGC-19-SED-0	02/20/06	08/22/07	Surface	FD	mg/kg	NA		**6.9**	J-	NA		954	J-	NA		29.0	J-	NA		NA		NA	
HGC-20-SED-0	02/20/06	02/24/06	Surface	REG	mg/kg	0.5	J	**1.3**	J	0.15	J	154		9,630	J	6.6	J	3.5	J	0.56	J	17	J
HGC-21-SED-0	02/20/06	08/22/07	Surface	REG	mg/kg	NA		**3.6**	J-	NA		368	J-	NA		21.4	J-	NA		NA		NA	
HGC-22-SED-0	02/20/06	08/22/07	Surface	REG	mg/kg	NA		**7.4**	J-	NA		**14,700**	J-	NA		26.4	J-	NA		NA		NA	

TABLE 4-7
Soil Sampling Laboratory Value Exceedances for Full Inorganic Target Analyte List
Non-Residential Properties
Remedial Investigation Report
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The data in this table are illustrated on figures 4-2, 4-3, 4-4, 4-5, 4-6, 4-7, 4-8, 4-9, 4-10, 4-11, 4-12, 4-14, and 4-16.

Arizona Residential Soil Remediation Level[1] (mg/kg):						**31**		**10**		**39**		**3,100**		**--**		**400**		**390**		**5.2**		**78**	
EPA Region IX Preliminary Remediation Goal[2] (mg/kg):						**31**		**0.39**		**37**		**3,100**		**23,000**		**400**		**390**		**5.2**		**78**	
Location/	**Sample**	**Shipment**		**Sample**		**Antimony**		**Arsenic**		**Cadmium**		**Copper**		**Iron**		**Lead**		**Molybdenum**		**Thallium**		**Vanadium**	
Parcel ID	**Date**	**Date**	**Depth**	**Type**	**Units**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**
HGC-23-SED-0	02/21/06	08/22/07	Surface	REG	mg/kg	NA		**7.7**	J-	NA		1,000	J-	NA		34.8	J-	NA		NA		NA	
HGC-24-SED-0	02/21/06	08/22/07	Surface	REG	mg/kg	NA		**18.8**	J-	NA		1,570	J-	NA		64.1	J-	NA		NA		NA	
HGC-24-SED-0	02/21/06	08/22/07	Surface	FD	mg/kg	NA		**24.8**	J-	NA		1,560	J-	NA		74.5	J-	NA		NA		NA	
HGC-25-SED-0	02/21/06	08/22/07	Surface	REG	mg/kg	NA		**42.6**	J-	NA		**4,210**	J-	NA		104	J-	NA		NA		NA	
HGC-26-SED-0	02/21/06	08/22/07	Surface	REG	mg/kg	NA		**18.1**	J-	NA		**3,390**	J-	NA		85.4	J-	NA		NA		NA	
HGC-27-SED-0	02/21/06	08/22/07	Surface	REG	mg/kg	NA		**15.8**	J-	NA		2,620	J-	NA		54.7	J-	NA		NA		NA	
HGC-28-SED-0	02/21/06	08/22/07	Surface	REG	mg/kg	NA		**34.1**	J-	NA		**4,890**	J-	NA		130	J-	NA		NA		NA	
HGC-29-SED-0	02/21/06	08/22/07	Surface	REG	mg/kg	NA		**60.4**	J-	NA		**8,460**	J-	NA		227	J-	NA		NA		NA	
HGC-30-SED-0	02/21/06	02/24/06	Surface	REG	mg/kg	3.5	J	**81.1**	J	9.5	J+	**9,320**		**25,900**	J	191	J	65.4	J	0.69	J-	46.3	J
HGC-30-SED-0	02/21/06	09/14/07	Surface	REG	mg/kg	NA		**87.8**	J-	NA		**9,210**	J-	NA		193	J-	NA		NA		NA	
HGC-30-SED-1	02/21/06	08/22/07	Subsurface	REG	mg/kg	NA		**6.5**	J-	NA		324	J-	NA		15.7	J-	NA		NA		NA	
HGC-31-SED-0	02/21/06	08/22/07	Surface	REG	mg/kg	NA		**13.9**	J-	NA		**4,040**	J-	NA		34.0	J-	NA		NA		NA	
HGC-32-SED-0	02/21/06	08/22/07	Surface	REG	mg/kg	NA		**6.4**	J-	NA		692	J-	NA		20.0	J-	NA		NA		NA	
HGC-33-SED-0	02/21/06	02/24/06	Surface	REG	mg/kg	2.7	J	**13.2**	J	1.3	J+	1,600		**49,600**	J	53.4	J	23.2	J	3.4	J-	**105**	J
Hayden Public Areas:																							
HPUB-01-SED-0	02/24/06	02/24/06	Surface	REG	mg/kg	3.7	J	**40.7**		8		**22,400**		**30,800**		204	J	148		1.2	UJ	50.9	
HPUB-01-SED-0	02/24/06	09/14/07	Surface	REG	mg/kg	NA		**60.9**	J-	NA		**24,400**	J-	NA		209	J-	NA		NA		NA	
HPUB-01-SED-1	02/24/06	08/24/07	Subsurface	REG	mg/kg	NA		**26.4**	J-	NA		3,010	J-	NA		89.5	J-	NA		NA		NA	
HPUB-02-SED-0	02/24/06	08/24/07	Surface	REG	mg/kg	NA		**50.0**	J-	NA		**19,000**	J-	NA		156	J-	NA		NA		NA	
HPUB-02-SED-1	02/24/06	02/24/06	Subsurface	REG	mg/kg	5.9	UJ	**3.7**		0.17	J	42.6		4,340		47.5	J	11.8		4.1	U	10.1	UJ
HPUB-03-SED-1	02/24/06	08/24/07	Subsurface	REG	mg/kg	NA		**19.8**	J-	NA		**3,940**	J-	NA		80.5	J-	NA		NA		NA	
HPUB-04-SED-0	02/24/06	08/24/07	Surface	REG	mg/kg	NA		**25.7**	J-	NA		**6,880**	J-	NA		62.6	J-	NA		NA		NA	
HPUB-04-SED-1	02/24/06	08/24/07	Subsurface	REG	mg/kg	NA		**9.6**	J-	NA		2,480	J-	NA		41.0	J-	NA		NA		NA	
HPUB-04-SED-1	02/24/06	08/24/07	Subsurface	FD	mg/kg	NA		**10.0**	J-	NA		2,250	J-	NA		35.6	J-	NA		NA		NA	
HPUB-05-SED-0	02/24/06	08/24/07	Surface	REG	mg/kg	NA		**5.5**	J-	NA		1,460	J-	NA		16.8	J-	NA		NA		NA	
HPUB-05-SED-1	02/24/06	08/24/07	Subsurface	REG	mg/kg	NA		**3.9**	J-	NA		716	J-	NA		12.9	J-	NA		NA		NA	
HPUB-06-SED-0	02/24/06	08/24/07	Surface	REG	mg/kg	NA		**10.0**	J-	NA		2,210	J-	NA		31.2	J-	NA		NA		NA	
HPUB-06-SED-1	02/24/06	08/24/07	Subsurface	REG	mg/kg	NA		**8.6**	J-	NA		1,560	J-	NA		41.6	J-	NA		NA		NA	
HPUB-07-SED-0	02/24/06	08/24/07	Surface	REG	mg/kg	NA		**16.5**	J-	NA		**7,770**	J-	NA		98.2	J-	NA		NA		NA	
HPUB-07-SED-1	02/24/06	08/24/07	Subsurface	REG	mg/kg	NA		**8.0**	J-	NA		1,550	J-	NA		43.1	J-	NA		NA		NA	
HPUB-07-SED-1	02/24/06	08/24/07	Subsurface	FD	mg/kg	NA		**8.7**	J-	NA		1,600	J-	NA		40.7	J-	NA		NA		NA	
HPUB-08-SED-0	02/24/06	08/24/07	Surface	REG	mg/kg	NA		**6.2**	J-	NA		2,590	J-	NA		37.7	J-	NA		NA		NA	
HPUB-08-SED-1	02/24/06	08/24/07	Subsurface	REG	mg/kg	NA		**9.2**	J-	NA		2,070	J-	NA		65.8	J-	NA		NA		NA	
HPUB-09-SED-0	02/24/06	08/24/07	Surface	REG	mg/kg	NA		**9.4**	J-	NA		**3,410**	J-	NA		40.6	J-	NA		NA		NA	
HPUB-09-SED-1	02/24/06	08/24/07	Subsurface	REG	mg/kg	NA		**8.5**	J-	NA		**3,170**	J-	NA		41.3	J-	NA		NA		NA	

TABLE 4-7
Soil Sampling Laboratory Value Exceedances for Full Inorganic Target Analyte List
Non-Residential Properties
Remedial Investigation Report
ASARCO LLC Hayden, Arizona Plant Site

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Arizona Residential Soil Remediation Level[1] (mg/kg):						**31**		**10**		**39**		**3,100**		**--**		**400**		**390**		**5.2**		**78**	
EPA Region IX Preliminary Remediation Goal[2] (mg/kg):						**31**		**0.39**		**37**		**3,100**		**23,000**		**400**		**390**		**5.2**		**78**	
Location/	**Sample**	**Shipment**		**Sample**		**Antimony**		**Arsenic**		**Cadmium**		**Copper**		**Iron**		**Lead**		**Molybdenum**		**Thallium**		**Vanadium**	
Parcel ID	**Date**	**Date**	**Depth**	**Type**	**Units**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**
HPUB-10-SED-0	02/24/06	08/24/07	Surface	REG	mg/kg	NA		**20.0**	J-	NA		**8,100**	J-	NA		58.3	J-	NA		NA		NA	
HPUB-10-SED-1	02/24/06	08/24/07	Subsurface	REG	mg/kg	NA		**16.7**	J-	NA		**8,210**	J-	NA		39.1	J-	NA		NA		NA	
Kennecott Avenue Wash:																							
KAW-01-SED-0	02/22/06	08/24/07	Surface	REG	mg/kg	NA		**3.1**	J-	NA		569	J-	NA		9.6	J-	NA		NA		NA	
KAW-02-SED-0	02/22/06	02/24/06	Surface	REG	mg/kg	0.84	J	**1.6**		0.3	UJ	2,900		11,200		9.6		55		0.7	U	14.1	
KAW-03-SED-0	02/22/06	08/24/07	Surface	REG	mg/kg	NA		**2.7**	J-	NA		**3,920**	J-	NA		7.3	J-	NA		NA		NA	
KAW-04-SED-0	02/22/06	08/24/07	Surface	REG	mg/kg	NA		**4.4**	J-	NA		1,840	J-	NA		11.5	J-	NA		NA		NA	
KAW-05-SED-0	02/22/06	08/24/07	Surface	REG	mg/kg	NA		**7.5**	J-	NA		1,650	J-	NA		31.3	J-	NA		NA		NA	
KAW-05-SED-0	02/22/06	08/24/07	Surface	FD	mg/kg	NA		**6.8**	J-	NA		1,750	J-	NA		31.7	J-	NA		NA		NA	
KAW-06-SED-0	02/22/06	08/24/07	Surface	REG	mg/kg	NA		**15.5**	J-	NA		**4,720**	J-	NA		81.5	J-	NA		NA		NA	
KAW-07-SED-0	02/22/06	08/24/07	Surface	REG	mg/kg	NA		**2.6**	J-	NA		567	J-	NA		7.9	J-	NA		NA		NA	
KAW-08-SED-0	02/22/06	08/24/07	Surface	REG	mg/kg	NA		**2.2**	J-	NA		628	J-	NA		5.3	J-	NA		NA		NA	
KAW-09-SED-0	02/23/06	08/24/07	Surface	REG	mg/kg	NA		**21.6**	J-	NA		**13,500**	J-	NA		64.9	J-	NA		NA		NA	
KAW-10-SED-0	02/23/06	08/24/07	Surface	REG	mg/kg	NA		**22.0**	J-	NA		**9,620**	J-	NA		97.7	J-	NA		NA		NA	
Former Kennecott Smelter:																							
KS-01-SED-0	02/21/06	02/24/06	Surface	REG	mg/kg	5.2	J	**224**	J+	25.8	J+	**56,200**		**49,000**	J	253	J	240	J	1.2	J-	**84.2**	J
KS-02-SED-0	02/21/06	02/24/06	Surface	REG	mg/kg	20.9	J	**345**	J	3.2	J+	**18,400**		**197,000**	J	**547**	J	**1,510**	J	5	J-	**105**	J
KS-02-SED-0	02/21/06	09/14/07	Surface	REG	mg/kg	NA		**307**	J-	NA		**15,900**	J-	NA		**481**	J-	NA		NA		NA	
KS-03-SED-0	02/21/06	02/24/06	Surface	REG	mg/kg	12.2	J	**140**	J	15.3		**56,700**		**54,100**	J	391	J	**488**	J	2.5		26.9	J
KS-04-SED-0	02/21/06	02/24/06	Surface	REG	mg/kg	14.5	J	**60.1**	J+	4.1	J+	**68,200**		**227,000**	J	325	J	**1,060**	J	2.4	J-	31.1	J
KS-04-SED-0	02/21/06	09/14/07	Surface	REG	mg/kg	NA		**99.4**	J-	NA		**63,800**	J-	NA		297	J-	NA		NA		NA	
KS-05-SED-0	02/21/06	08/24/07	Surface	REG	mg/kg	NA		**13.4**	J-	NA		**7,710**	J-	NA		30.7	J-	NA		NA		NA	
KS-05-SED-0	02/21/06	08/24/07	Surface	FD	mg/kg	NA		**12.9**	J-	NA		**7,540**	J-	NA		31.0	J-	NA		NA		NA	
KS-06-SED-0	02/21/06	02/24/06	Surface	REG	mg/kg	14.5	J	***2***	UJ	17.9		**192,000**		**182,000**	J	333	J	**2,280**	J	5.1		31.7	J
KS-07-SED-0	02/21/06	08/24/07	Surface	REG	mg/kg	NA		**12.4**	J-	NA		**7,400**	J-	NA		31.4	J-	NA		NA		NA	
KS-08-SED-0	02/21/06	02/24/06	Surface	REG	mg/kg	13	J	**114**	J	7.7		**92,800**		**146,000**	J	**539**	J	**1,490**	J	2.1		53.8	J
KS-09-SED-0	02/21/06	02/24/06	Surface	REG	mg/kg	9.9	J	**91.6**	J	25.9		**132,999**		**141,999**	J	**552**	J	**2,060**	J	**5.9**		48.5	J
KS-10-SED-0	02/21/06	08/24/07	Surface	REG	mg/kg	NA		**9.1**	J-	NA		**7,130**	J-	NA		18.6	J-	NA		NA		NA	
KS-11-SED-0	02/21/06	08/24/07	Surface	REG	mg/kg	NA		**106**		NA		**66,800**		NA		172		NA		NA		NA	
KS-12-SED-0	02/21/06	08/24/07	Surface	REG	mg/kg	NA		**54.2**		NA		**31,400**		NA		242		NA		NA		NA	
KS-13-SED-0	02/21/06	08/24/07	Surface	REG	mg/kg	NA		**38.5**		NA		**9,420**		NA		179		NA		NA		NA	
KS-14-SED-0	02/21/06	08/24/07	Surface	REG	mg/kg	NA		**90.7**		NA		**48,600**		NA		**450**		NA		NA		NA	
KS-15-SED-0	02/21/06	08/24/07	Surface	REG	mg/kg	NA		**70.2**		NA		**19,800**		NA		254		NA		NA		NA	
Perimeter of Concentrator:																							
PCON-01-SED-0	02/21/06	08/24/07	Surface	REG	mg/kg	NA		**30.1**		NA		**7,170**		NA		67.7		NA		NA		NA	
PCON-02-SED-0	02/21/06	08/24/07	Surface	REG	mg/kg	NA		**19.2**	J	NA		**40,100**		NA		48.5		NA		NA		NA	

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Arizona Residential Soil Remediation Level[1] (mg/kg):						**31**		**10**		**39**		**3,100**		**--**		**400**		**390**		**5.2**		**78**	
EPA Region IX Preliminary Remediation Goal[2] (mg/kg):						**31**		**0.39**		**37**		**3,100**		**23,000**		**400**		**390**		**5.2**		**78**	
Location/	**Sample**	**Shipment**		**Sample**		**Antimony**		**Arsenic**		**Cadmium**		**Copper**		**Iron**		**Lead**		**Molybdenum**		**Thallium**		**Vanadium**	
Parcel ID	**Date**	**Date**	**Depth**	**Type**	**Units**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**
PCON-02-SED-0	02/21/06	08/24/07	Surface	FD	mg/kg	NA		**24.6**		NA		**41,100**		NA		50.2		NA		NA		NA	
PCON-03-SED-0	02/21/06	08/24/07	Surface	REG	mg/kg	NA		**65.4**		NA		**19,100**		NA		259		NA		NA		NA	
PCON-04-SED-0	02/21/06	08/24/07	Surface	REG	mg/kg	NA		**43.5**		NA		**20,700**		NA		117		NA		NA		NA	
PCON-05-SED-0	02/21/06	02/24/06	Surface	REG	mg/kg	3.7	J	**17.6**	J+	2.6	J+	**25,500**		**59,200**	J	96.7	J	383	J	1.6	J-	60.6	J
PCON-06-SED-0	02/21/06	02/24/06	Surface	REG	mg/kg	3.9	J	**76.2**	J+	8.9	J+	**23,300**		**36,800**	J	257	J	128	J	0.63	J-	66.9	J
PCON-06-SED-0	02/21/06	02/24/06	Surface	FD	mg/kg	3.9	J	**74.9**	J+	13.7	J+	**20,700**		**34,600**	J	277	J	129	J	0.7	UJ	65.3	J
PCON-08-SED-0	02/22/06	08/24/07	Surface	REG	mg/kg	NA		**5.3**		NA		**3,540**		NA		18.8		NA		NA		NA	
PCON-09-SED-0	02/22/06	08/24/07	Surface	REG	mg/kg	NA		**8.5**		NA		**3,300**		NA		37.5		NA		NA		NA	
PCON-10-SED-0	02/22/06	08/24/07	Surface	REG	mg/kg	NA		**34.8**		NA		**24,900**		NA		72.6		NA		NA		NA	
PCON-11-SED-0	02/22/06	02/24/06	Surface	REG	mg/kg	3.2	J	**40**		11.1		**53,800**		**68,000**		231		**1,240**		1.7	J	**93.3**	
PCON-11-SED-0	02/22/06	09/14/07	Surface	REG	mg/kg	NA		**81.6**	J-	NA		**57,800**	J-	NA		268	J-	NA		NA		NA	
PCON-12-SED-0	02/22/06	08/24/07	Surface	REG	mg/kg	NA		**68.1**		NA		**69,300**		NA		163		NA		NA		NA	
PCON-13-SED-0	02/22/06	08/24/07	Surface	REG	mg/kg	NA		**27.8**		NA		**5,740**		NA		84.3		NA		NA		NA	
PCON-14-SED-0	02/22/06	02/24/06	Surface	REG	mg/kg	1.7	J	***0.41***	U	2.8		**46,300**		**36,700**		68.7		122		0.74	U	62.8	
PCON-15-SED-0	02/22/06	08/24/07	Surface	REG	mg/kg	NA		**18.7**		NA		**10,900**		NA		62.2		NA		NA		NA	
PCON-15-SED-0	02/22/06	08/24/07	Surface	FD	mg/kg	NA		**21.2**		NA		**11,200**		NA		51.6		NA		NA		NA	
PCON-16-SED-0	02/22/06	08/24/07	Surface	REG	mg/kg	NA		**13.4**		NA		**9,510**		NA		47.4		NA		NA		NA	
PCON-17-SED-0	02/22/06	08/24/07	Surface	REG	mg/kg	NA		**12.9**		NA		**7,530**		NA		21.3		NA		NA		NA	
PCON-18-SED-0	02/22/06	08/24/07	Surface	REG	mg/kg	NA		**10.5**		NA		2,440		NA		38.9		NA		NA		NA	
PCON-19-SED-0	02/22/06	08/24/07	Surface	REG	mg/kg	NA		**57.6**	J-	NA		**17,700**	J-	NA		158	J-	NA		NA		NA	
PCON-20-SED-0	02/22/06	02/24/06	Surface	REG	mg/kg	**38.2**	J	**1,720**		11.3		**14,100**		**117,999**		260		203		0.89	J	40.4	
PCON-21-SED-0	02/22/06	02/24/06	Surface	REG	mg/kg	7.3	J	**140**		15		**35,000**		**45,400**		329		278		1.2	J	**105**	
PCON-22-SED-0	02/22/06	02/24/06	Surface	REG	mg/kg	4.1	J	**91.3**		8.6		**18,500**		**43,600**		200		188		0.72	J	62.8	
PCON-23-SED-0	02/22/06	02/24/06	Surface	REG	mg/kg	27.6	J	**635**		9		**12,600**		**150,000**		222		189		1.4	J	28	
PCON-23-SED-0	02/22/06	09/14/07	Surface	REG	mg/kg	NA		**769**	J-	NA		**11,000**	J-	NA		275	J-	NA		NA		NA	
PCON-24-SED-0	02/22/06	02/24/06	Surface	REG	mg/kg	2.8	J	**13.2**		2.6		**10,200**		**52,900**		65.4		231		1	J	60.5	
PCON-24-SED-0	02/22/06	09/14/07	Surface	REG	mg/kg	NA		**23.3**	J-	NA		**10,400**	J-	NA		76.1	J-	NA		NA		NA	
PCON-25-SED-0	02/22/06	02/24/06	Surface	REG	mg/kg	10.6	J	**18.1**		8		**59,700**		**162,999**		348		**1,020**		3.7		26.6	
PCON-26-SED-0	02/23/06	02/24/06	Surface	REG	mg/kg	1.6	J	**9.3**		1.8		**7,540**		**28,900**		45.6	J	78.8		0.58	UJ	47	
PCON-27-SED-0	02/23/06	08/24/07	Surface	REG	mg/kg	NA		**32.6**	J-	NA		**26,100**	J-	NA		226	J-	NA		NA		NA	
PCON-28-SED-0	02/23/06	08/24/07	Surface	REG	mg/kg	NA		**17.9**	J-	NA		1,980	J-	NA		54.6	J-	NA		NA		NA	
Power House Wash:																							
PHW-SED-01AS	11/17/05	11/22/05	Surface	REG	mg/kg	3.3	J-	**35.7**	J	3.7	J	**6,030**		**43,300**		130	J	40.2	J	2	J	68.9	J
PHW-SED-02AS	11/17/05	11/22/05	Surface	REG	mg/kg	2.2	U	**43.3**		4.6		**7,700**		**38,100**		145		NA		1.2	J	63.5	
PHW-SED-02BS	11/17/05	11/22/05	Subsurface	REG	mg/kg	3.2	J-	**37.9**	J	4.1	J	**11,100**		**58,900**		140	J	48.8	J	1.7	J	63.2	J

TABLE 4-7
Soil Sampling Laboratory Value Exceedances for Full Inorganic Target Analyte List
Non-Residential Properties
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The data in this table are illustrated on figures 4-2, 4-3, 4-4, 4-5, 4-6, 4-7, 4-8, 4-9, 4-10, 4-11, 4-12, 4-14, and 4-16.

Arizona Residential Soil Remediation Level[1] (mg/kg):						**31**		**10**		**39**		**3,100**		**--**		**400**		**390**		**5.2**		**78**	
EPA Region IX Preliminary Remediation Goal[2] (mg/kg):						**31**		**0.39**		**37**		**3,100**		**23,000**		**400**		**390**		**5.2**		**78**	
Location/	**Sample**	**Shipment**		**Sample**		**Antimony**		**Arsenic**		**Cadmium**		**Copper**		**Iron**		**Lead**		**Molybdenum**		**Thallium**		**Vanadium**	
Parcel ID	**Date**	**Date**	**Depth**	**Type**	**Units**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**
PHW-SED-03AS	11/17/05	11/22/05	Surface	REG	mg/kg	2.1	J-	**36.4**	J	3.9	J	**8,270**		**33,700**		110	J	65.8	J	1.4		67	J
PHW-SED-04AS	11/17/05	11/22/05	Surface	REG	mg/kg	2.2	J-	**25.4**	J	3.4	J	**6,070**		**35,000**		104	J	45.2	J	2.1		72.7	J
PHW-SED-05AS	11/17/05	11/22/05	Surface	REG	mg/kg	2.7	U	**75.3**		8.3		**12,200**		**37,000**		239		NA		0.82	J	58.1	
PHW-SED-05AS	11/17/05	11/22/05	Surface	FD	mg/kg	2.5	U	**77.4**		8.5		**12,100**		**37,700**		242		NA		0.57	J	56.3	
PHW-SED-05BS	11/17/05	11/22/05	Subsurface	REG	mg/kg	2.2	U	**32.5**		3.6		**6,270**		**45,700**		105		NA		1.1	J	54.7	
PHW-SED-06AS	11/17/05	11/22/05	Surface	REG	mg/kg	3.1	J-	**36.1**		1.7		**8,810**		**54,800**		125		NA		0.35	U	43.6	
PHW-SED-06BS	11/17/05	11/22/05	Subsurface	REG	mg/kg	3.3	J-	**24**		1.2		**9,190**		**52,200**		78.6		NA		0.5	J	30.6	
PHW-SED-07AS	11/17/05	11/22/05	Surface	REG	mg/kg	3.6	J-	**43.5**		3.2		**9,030**		**63,300**		146		NA		0.21	J	49.9	
PHW-SED-07BS	11/17/05	11/22/05	Subsurface	REG	mg/kg	2.3	U	**35.2**		3.8		**8,070**		**43,700**		110		NA		1.4		60.6	
PHW-SED-08AS	11/18/05	11/22/05	Surface	REG	mg/kg	2.6	U	**16.5**		1.5		**4,650**		**37,600**		54		NA		1	J	41.7	
PHW-SED-08BS	11/18/05	11/22/05	Subsurface	REG	mg/kg	1.6	U	**13.3**		1.4		**6,610**		**31,000**		42.7		NA		1.3	J	57.6	
PHW-SED-09AS	11/18/05	11/22/05	Surface	REG	mg/kg	2.1	U	**21.5**		1.6		**8,510**		**40,200**		63.4		NA		0.91	J	45	
PHW-SED-10AS	11/18/05	11/22/05	Surface	REG	mg/kg	0.93	U	**8.9**		1.3		2,380		19,500		31.9		NA		1.6		51	
PHW-SED-10AS	11/18/05	11/22/05	Surface	FD	mg/kg	0.93	U	**10**		1.4		2,940		**23,000**		36.1		NA		1.3		54.9	
PHW-SED-11AS	11/18/05	11/22/05	Surface	REG	mg/kg	0.49	U	**10.4**		0.79		**6,670**		**35,000**		14.3		NA		1.5		**79.8**	
PHW-SED-12AS	11/18/05	11/22/05	Surface	REG	mg/kg	0.62	U	**4.6**		0.36		1,230		18,300		13.3		NA		1.6		56.5	
PHW-SED-13AS	11/18/05	11/22/05	Surface	REG	mg/kg	0.61	U	**6.1**		0.41		2,270		9,590		15		NA		0.2	J	16.5	
PHW-SED-14AS	11/18/05	11/22/05	Surface	REG	mg/kg	0.97	U	**7.9**		1.4		1,770		**24,700**		55.1		NA		1.8		63.9	
PHW-SED-15AS	11/18/05	11/22/05	Surface	REG	mg/kg	1	U	**22**		2.8		**5,650**		**26,500**		86.9		NA		1.1	J	52.8	
Perimeter of Smelter:																							
PSMT-01-SED-0	02/23/06	02/24/06	Surface	REG	mg/kg	30.7	J	**107**		22.8		**369,000**		**104,000**		**1,200**		284		3.2		6.9	
PSMT-01-SED-0	02/23/06	02/24/06	Surface	FD	mg/kg	**36.8**	J	**121**		17.6		**380,000**		**108,000**		**1,230**		300		3.3		4.5	UJ
Slag Dump:																							
SD-01-SED-0	02/23/06	02/24/06	Surface	REG	mg/kg	10.4	J	**24.7**		9.6		**47,200**		**186,999**		**468**		**1,060**		2.4	UJ	24.4	
Downgradient of Slag Dump:																							
SDD-01-SED-0	02/23/06	02/24/06	Surface	REG	mg/kg	7.5	J	**361**		**94.7**		**12,100**		**64,200**		308		235		0.73	U	70.6	
SDD-02-SED-0	02/23/06	02/24/06	Surface	REG	mg/kg	3.7	J	**232**		**82.4**		**10,200**		**34,400**		220		103		0.44	UJ	65	
SDD-03-SED-0	02/23/06	02/24/06	Surface	REG	mg/kg	2.6	J	**74**		18.8		**27,000**		**53,000**		112		119		0.71	UJ	69	
SDD-04-SED-0	02/23/06	08/24/07	Surface	REG	mg/kg	NA		**23.8**	J-	NA		1,400	J-	NA		23.2	J-	NA		NA		NA	
San Pedro Wash:																							
SPW-SED-01AS	11/16/05	11/22/05	Surface	REG	mg/kg	1.2	J-	**23.1**	J	2.9	J	**10,500**		**35,200**		51.5	J	64.2	J	1.1		65.4	J
SPW-SED-02AS	11/16/05	11/22/05	Surface	REG	mg/kg	2	J-	**29.7**	J	3.4	J	**12,500**		**36,200**		67	J	86	J	0.62	J	63.3	J
SPW-SED-03AS	11/16/05	11/22/05	Surface	REG	mg/kg	1.5	J-	**23.2**	J	3.5	J	**7,230**		**29,300**		118	J	31.4	J	2		65.9	J
SPW-SED-04AS	11/16/05	11/22/05	Surface	REG	mg/kg	1	J-	**15.1**	J	2.2	J	**5,970**		**27,900**		30.9	J	35.4	J	1.6		69.6	J
SPW-SED-05AS	11/16/05	11/22/05	Surface	REG	mg/kg	0.99	J-	**24.7**	J	3.3	J	**6,260**		17,700		89.7	J	38.5	J	0.85		38.1	J

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Non-Residential Properties
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Arizona Residential Soil Remediation Level[1] (mg/kg):						**31**		**10**		**39**		**3,100**		**--**		**400**		**390**		**5.2**		**78**	
EPA Region IX Preliminary Remediation Goal[2] (mg/kg):						**31**		**0.39**		**37**		**3,100**		**23,000**		**400**		**390**		**5.2**		**78**	
Location/	**Sample**	**Shipment**		**Sample**		**Antimony**		**Arsenic**		**Cadmium**		**Copper**		**Iron**		**Lead**		**Molybdenum**		**Thallium**		**Vanadium**	
Parcel ID	**Date**	**Date**	**Depth**	**Type**	**Units**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**
SPW-SED-06AS	11/16/05	11/22/05	Surface	REG	mg/kg	1.5	J-	**28.9**	J	4.8	J	**7,050**		**24,700**		129	J	32.7	J	1.4		51	J
SPW-SED-07AS	11/17/05	11/22/05	Surface	REG	mg/kg	1	J-	**5.5**	J	0.94	J	926		17,500		24.1	J	3.8	J	2.1		53.5	J
SPW-SED-08AS	11/17/05	11/22/05	Surface	REG	mg/kg	1.3	J-	**18.3**	J	3.8	J	**4,950**		19,900		90.4	J	32.7	J	1.3		43.7	J
SPW-SED-09AS	11/17/05	11/22/05	Surface	REG	mg/kg	0.96	J-	**13**	J	2	J	**3,150**		17,700		57.8	J	22.4	J	0.93		40.8	J
SPW-SED-10AS	11/17/05	11/22/05	Surface	REG	mg/kg	0.85	J-	**9**	J	1.8	J	2,440		16,300		45.4	J	13.3	J	1.3		42.6	J
SPW-SED-11AS	11/16/05	11/22/05	Surface	REG	mg/kg	0.97	J-	**17.7**	J	2.2	J	2,860		11,400		62.6	J	28.6	J	0.39	J	18.8	J
SPW-SED-11AS	11/16/05	11/22/05	Surface	FD	mg/kg	2.1	J-	**19**	J	2.3	J	3,050		13,100		64.6	J	32.7	J	0.48	J	20.9	J
SPW-SED-12AS	11/16/05	11/22/05	Surface	REG	mg/kg	1	J-	**14.3**	J	2.6	J	**6,060**		**26,900**		35.6	J	35.1	J	1.7		64.7	J
SPW-SED-13AS	11/16/05	11/22/05	Surface	REG	mg/kg	1.4	J-	**13.5**	J	1.9	J	**5,170**		**26,900**		65.3	J	39	J	1.3		49.9	J
SPW-SED-14AS	11/16/05	11/22/05	Surface	REG	mg/kg	1.2	J-	**9.5**	J	1.6	J	2,230		12,900		38.6	J	41.2	J	0.81		30.4	J
SPW-SED-15AS	11/17/05	11/22/05	Surface	REG	mg/kg	1.5	J-	**16.4**	J	2.1	J	**4,920**		22,200		60.8	J	41.8	J	1.4		50.3	J
SPW-SED-16AS	02/22/06	09/26/06	Surface	REG	mg/kg	20	U	**28**		4	U	**4,700**		**320,000**		17		72		***10***	U	32	
SPW-SED-16AS	02/22/06	08/24/07	Surface	REG	mg/kg	NA		**11.1**		NA		**5,160**		NA		17.7		NA		NA		NA	
SPW-SED-17AS	02/22/06	08/24/07	Surface	REG	mg/kg	NA		**6.4**		NA		**7,250**		NA		12.0		NA		NA		NA	
State Route 77:																							
SR77-01-SED-0	02/21/06	02/24/06	Surface	REG	mg/kg	2.6	J	**39.1**	J+	8.3	J+	**8,130**		**27,200**	J	231	J	37.6	J	0.7	UJ	42.9	J
SR77-01-SED-0.3	02/21/06	08/24/07	Subsurface	REG	mg/kg	NA		**18.0**	J-	NA		622	J-	NA		20.6	J-	NA		NA		NA	
SR77-02-SED-0	02/21/06	08/24/07	Surface	REG	mg/kg	NA		**10.0**	J-	NA		1,290	J-	NA		32.6	J-	NA		NA		NA	
SR77-02-SED-0.3	02/21/06	08/24/07	Subsurface	REG	mg/kg	NA		**26.6**	J-	NA		2,820	J-	NA		101	J-	NA		NA		NA	
SR77-02-SED-0.3	02/21/06	08/24/07	Subsurface	FD	mg/kg	NA		**31.4**	J-	NA		**3,110**	J-	NA		114	J-	NA		NA		NA	
SR77-03-SED-0	02/21/06	08/24/07	Surface	REG	mg/kg	NA		**29.7**	J-	NA		**3,490**	J-	NA		72.6	J-	NA		NA		NA	
SR77-03-SED-0.3	02/21/06	08/24/07	Subsurface	REG	mg/kg	NA		**26.2**	J-	NA		2,860	J-	NA		73.8	J-	NA		NA		NA	
Tailing Pond AB/BC:																							
TPA-01-SED-0	02/23/06	08/24/07	Surface	REG	mg/kg	NA		**10.0**	J-	NA		2,240	J-	NA		19.0	J-	NA		NA		NA	
TPA-02-SED-0	02/23/06	08/24/07	Surface	REG	mg/kg	NA		**8.6**	J-	NA		1,450	J-	NA		35.6	J-	NA		NA		NA	
TPA-03-SED-0	02/23/06	08/24/07	Surface	REG	mg/kg	NA		**21.8**	J-	NA		2,180	J-	NA		80.0	J-	NA		NA		NA	
TPA-04-SED-0	02/23/06	08/24/07	Surface	REG	mg/kg	NA		**24.5**	J-	NA		2,770	J-	NA		110	J-	NA		NA		NA	
TPA-05-SED-0	02/23/06	08/24/07	Surface	REG	mg/kg	NA		**10.0**	J-	NA		2,020	J-	NA		19.9	J-	NA		NA		NA	
TPA-05-SED-0	02/23/06	08/24/07	Surface	FD	mg/kg	NA		**11.9**	J-	NA		2,770	J-	NA		14.1	J-	NA		NA		NA	
TPA-06-SED-0	02/23/06	08/24/07	Surface	REG	mg/kg	NA		**4.8**	J-	NA		**3,730**	J-	NA		8.2	J-	NA		NA		NA	
TPA-07-SED-0	02/23/06	02/24/06	Surface	REG	mg/kg	2.4	J	**13.7**		1.1		1,990		**36,100**		60	J	90.2		0.68	UJ	**79.4**	
TPA-08-SED-0	02/23/06	08/24/07	Surface	REG	mg/kg	NA		**27.3**	J-	NA		2,360	J-	NA		97.3	J-	NA		NA		NA	
Tailings Pond D:																							
TPD-01-SED-0	02/23/06	08/24/07	Surface	REG	mg/kg	NA		**11.6**	J-	NA		2,250	J-	NA		49.4	J-	NA		NA		NA	
TPD-02-SED-0	02/23/06	08/24/07	Surface	REG	mg/kg	NA		**10.0**	J-	NA		**3,920**	J-	NA		24.9	J-	NA		NA		NA	

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The data in this table are illustrated on figures 4-2, 4-3, 4-4, 4-5, 4-6, 4-7, 4-8, 4-9, 4-10, 4-11, 4-12, 4-14, and 4-16.

Arizona Residential Soil Remediation Level[1] (mg/kg):						**31**		**10**		**39**		**3,100**		**--**		**400**		**390**		**5.2**		**78**	
EPA Region IX Preliminary Remediation Goal[2] (mg/kg):						**31**		**0.39**		**37**		**3,100**		**23,000**		**400**		**390**		**5.2**		**78**	
Location/	**Sample**	**Shipment**		**Sample**		**Antimony**		**Arsenic**		**Cadmium**		**Copper**		**Iron**		**Lead**		**Molybdenum**		**Thallium**		**Vanadium**	
Parcel ID	**Date**	**Date**	**Depth**	**Type**	**Units**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**
TPD-03-SED-0	02/23/06	08/24/07	Surface	REG	mg/kg	NA		**10.1**	J-	NA		2,680	J-	NA		39.8	J-	NA		NA		NA	
TPD-04-SED-0	02/23/06	08/24/07	Surface	REG	mg/kg	NA		**18.1**	J-	NA		**6,000**	J-	NA		59.2	J-	NA		NA		NA	
Upland Areas/Background:																							
UP-01-SED-0	02/21/06	02/24/06	Surface	REG	mg/kg	0.94	J	**10.9**	J+	1.7	J+	1,540		**26,100**	J	41.1	J	4.4	J	0.4	J-	71.8	J
UP-01-SED-1	02/21/06	08/24/07	Subsurface	REG	mg/kg	NA		**13.2**	J-	NA		1,640	J-	NA		45.2	J-	NA		NA		NA	
UP-02-SED-0	02/23/06	08/24/07	Surface	REG	mg/kg	NA		**70.0**	J-	NA		**10,200**	J-	NA		247	J-	NA		NA		NA	
UP-02-SED-1	02/23/06	08/24/07	Subsurface	REG	mg/kg	NA		**31.3**	J-	NA		**3,240**	J-	NA		88.5	J-	NA		NA		NA	
UP-02-SED-1	02/23/06	08/24/07	Subsurface	FD	mg/kg	NA		**28.3**	J-	NA		**3,620**	J-	NA		94.8	J-	NA		NA		NA	
UP-03-SED-0	02/23/06	08/24/07	Surface	REG	mg/kg	NA		**3.5**	J-	NA		220	J-	NA		17.2	J-	NA		NA		NA	
UP-03-SED-1	02/23/06	08/24/07	Subsurface	REG	mg/kg	NA		**2.5**	J-	NA		69.4	J-	NA		9.8	J-	NA		NA		NA	
UPA-01-SED-0	02/22/06	02/24/06	Surface	REG	mg/kg	1.3	J	**6.7**	J	1.6	J+	854		**33,700**	J	36.3	J	3.5	J	0.71	UJ	**86.3**	J
UPA-01-SED-0.5	02/22/06	08/24/07	Subsurface	REG	mg/kg	NA		**3.7**	J-	NA		269	J-	NA		13.1	J-	NA		NA		NA	
UPA-02-SED-0	02/22/06	08/24/07	Surface	REG	mg/kg	NA		**5.8**	J-	NA		983	J-	NA		46.7	J-	NA		NA		NA	
UPA-02-SED-0.66	02/22/06	08/24/07	Subsurface	REG	mg/kg	NA		**4.6**	J-	NA		210	J-	NA		17.5	J-	NA		NA		NA	
UPA-03-SED-0	02/22/06	08/24/07	Surface	REG	mg/kg	NA		**5.7**	J-	NA		505	J-	NA		18.0	J-	NA		NA		NA	
UPA-03-SED-10	02/22/06	08/24/07	Subsurface	REG	mg/kg	NA		**6.0**	J-	NA		49.5	J-	NA		14.2	J-	NA		NA		NA	
UPA-04-SED-0	02/22/06	08/24/07	Surface	REG	mg/kg	NA		**4.6**	J-	NA		423	J-	NA		19.4	J-	NA		NA		NA	
UPA-04-SED-0	02/22/06	08/24/07	Surface	FD	mg/kg	NA		**6.0**	J-	NA		501	J-	NA		23.8	J-	NA		NA		NA	
UPA-04-SED-1	02/22/06	02/24/06	Subsurface	REG	mg/kg	0.39	J	**1.8**		0.08	UJ	16.6		11,500		5.1		0.25		0.72	U	22.4	
UPA-04-SED-1	02/22/06	02/24/06	Subsurface	FD	mg/kg	0.28	J	**2.2**		0.11	UJ	16.9		12,000		5.5		0.12		0.71	U	23.2	
UPA-05-SED-0	02/22/06	08/24/07	Surface	REG	mg/kg	NA		**8.2**	J-	NA		765	J-	NA		28.3	J-	NA		NA		NA	
UPA-05-SED-0.66	02/22/06	08/24/07	Subsurface	REG	mg/kg	NA		**3.1**	J-	NA		110	J-	NA		9.5	J-	NA		NA		NA	
UPA-06-SED-0	02/22/06	08/24/07	Surface	REG	mg/kg	NA		**7.4**	J-	NA		614	J-	NA		31.2	J-	NA		NA		NA	
UPA-06-SED-10.66	02/22/06	08/24/07	Subsurface	REG	mg/kg	NA		**3.2**	J-	NA		77.1	J-	NA		9.3	J-	NA		NA		NA	
UPA-07-SED-0	02/22/06	02/24/06	Surface	REG	mg/kg	1.2	J	**9.1**	J	0.92		882		21,100	J	41.1	J	15.9	J	0.87		41.6	J
UPA-07-SED-0.66	02/22/06	08/24/07	Subsurface	REG	mg/kg	NA		**4.3**	J-	NA		262	J-	NA		18.4	J-	NA		NA		NA	
UPA-08-SED-0	02/22/06	08/28/07	Surface	REG	mg/kg	NA		**27.2**	J-	NA		**6,310**	J-	NA		143	J-	NA		NA		NA	
UPA-08-SED-0.5	02/22/06	08/28/07	Subsurface	REG	mg/kg	NA		**9.4**	J-	NA		1,540	J-	NA		38.1	J-	NA		NA		NA	
UPA-09-SED-0	02/22/06	08/28/07	Surface	REG	mg/kg	NA		**12.5**	J-	NA		**3,250**	J-	NA		84.4	J-	NA		NA		NA	
UPA-09-SED-0.5	02/22/06	08/28/07	Subsurface	REG	mg/kg	NA		**8.3**	J-	NA		809	J-	NA		28.1	J-	NA		NA		NA	
Winkelman School Complex:																							
WSC-01-SED-0	02/20/06	08/24/07	Surface	REG	mg/kg	NA		**14.9**		NA		1,170		NA		35.1		NA		NA		NA	
WSC-01-SED-0	02/20/06	08/24/07	Surface	FD	mg/kg	NA		**13.4**		NA		1,080		NA		35.5		NA		NA		NA	
WSC-02-SED-0	02/20/06	08/24/07	Surface	REG	mg/kg	NA		**3.4**		NA		727		NA		19.3		NA		NA		NA	
WSC-03-SED-0	02/20/06	08/24/07	Surface	REG	mg/kg	NA		**4.7**		NA		730		NA		29.8		NA		NA		NA	

TABLE 4-7
Soil Sampling Laboratory Value Exceedances for Full Inorganic Target Analyte List
Non-Residential Properties
Remedial Investigation Report
ASARCO LLC Hayden, Arizona Plant Site

The data in this table are illustrated on figures 4-2, 4-3, 4-4, 4-5, 4-6, 4-7, 4-8, 4-9, 4-10, 4-11, 4-12, 4-14, and 4-16.

Arizona Residential Soil Remediation Level[1] (mg/kg):						**31**		**10**		**39**		**3,100**		**--**		**400**		**390**		**5.2**		**78**	
EPA Region IX Preliminary Remediation Goal[2] (mg/kg):						**31**		**0.39**		**37**		**3,100**		**23,000**		**400**		**390**		**5.2**		**78**	
Location/	**Sample**	**Shipment**		**Sample**		**Antimony**		**Arsenic**		**Cadmium**		**Copper**		**Iron**		**Lead**		**Molybdenum**		**Thallium**		**Vanadium**	
Parcel ID	**Date**	**Date**	**Depth**	**Type**	**Units**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**
WSC-04-SED-0	02/20/06	08/24/07	Surface	REG	mg/kg	NA		**4.5**		NA		392		NA		16.0		NA		NA		NA	
WSC-05-SED-0	02/20/06	08/24/07	Surface	REG	mg/kg	NA		**6.8**		NA		876		NA		20.6		NA		NA		NA	
WSC-06-SED-0	02/20/06	08/24/07	Surface	REG	mg/kg	NA		**7.4**		NA		1,210		NA		42.5		NA		NA		NA	
WSC-07-SED-0	02/20/06	08/24/07	Surface	REG	mg/kg	NA		**5.8**		NA		216		NA		25.2		NA		NA		NA	
WSC-08-SED-0	02/21/06	02/24/06	Surface	REG	mg/kg	0.21	J	**2.1**	J	0.09	J	38.4		9,630	J	7	J	0.39	J	0.7	U	26.5	J
WSC-09-SED-0	02/21/06	08/24/07	Surface	REG	mg/kg	NA		**3.0**		NA		77.8		NA		9.0		NA		NA		NA	
WSC-10-SED-0	02/21/06	08/24/07	Surface	REG	mg/kg	NA		**2.5**		NA		58.2		NA		8.0		NA		NA		NA	
WSC-10-SED-0	02/21/06	08/24/07	Surface	FD	mg/kg	NA		**3.6**		NA		62.3		NA		8.2		NA		NA		NA	
WSC-11-SED-0	02/21/06	08/24/07	Surface	REG	mg/kg	NA		**3.5**		NA		58.0		NA		7.3		NA		NA		NA	
WSC-12-SED-0	02/21/06	08/24/07	Surface	REG	mg/kg	NA		**2.3**		NA		306		NA		20.3		NA		NA		NA	
WSC-13-SED-0	02/21/06	08/24/07	Surface	REG	mg/kg	NA		**4.1**		NA		311		NA		22.1		NA		NA		NA	
WSC-14-SED-0	02/21/06	08/24/07	Surface	REG	mg/kg	NA		**4.5**		NA		198		NA		13.6		NA		NA		NA	
WSC-15-SED-0	02/21/06	08/24/07	Surface	REG	mg/kg	NA		**3.1**		NA		62.1		NA		6.5		NA		NA		NA	
WSC-16-SED-0	02/21/06	08/24/07	Surface	REG	mg/kg	NA		**2.8**		NA		20.0		NA		3.4		NA		NA		NA	
WSC-17-SED-0	02/21/06	08/24/07	Surface	REG	mg/kg	NA		**3.2**		NA		60.5		NA		6.4		NA		NA		NA	
WSC-18-SED-0	02/21/06	02/24/06	Surface	REG	mg/kg	0.5	J	**2.3**	J	0.03	J+	65.8		13,500		10.4	J	1	J	0.49	J-	34	J
WSC-18-SED-0	02/21/06	09/14/07	Surface	REG	mg/kg	NA		**3.4**	J-	NA		132	J-	NA		13.3	J-	NA		NA		NA	
WSC-19-SED-0	02/21/06	08/24/07	Surface	REG	mg/kg	NA		**2.0**	J-	NA		45.7	J-	NA		12.0	J-	NA		NA		NA	
WSC-20-SED-0	02/21/06	08/24/07	Surface	REG	mg/kg	NA		**1.3**	J-	NA		42.6	J-	NA		8.9	J-	NA		NA		NA	
WSC-20-SED-0	02/21/06	08/24/07	Surface	FD	mg/kg	NA		**2.3**	J-	NA		74.9	J-	NA		12.5	J-	NA		NA		NA	
WSC-21-SED-0	02/21/06	08/24/07	Surface	REG	mg/kg	NA		**5.8**	J-	NA		538	J-	NA		30.9	J-	NA		NA		NA	
WSC-22-SED-0	02/21/06	08/24/07	Surface	REG	mg/kg	NA		**6.0**	J-	NA		497	J-	NA		21.5	J-	NA		NA		NA	
WSC-23-SED-0	02/21/06	08/24/07	Surface	REG	mg/kg	NA		**2.0**	J-	NA		44.9	J-	NA		9.6	J-	NA		NA		NA	
WSC-24-SED-0	02/21/06	08/24/07	Surface	REG	mg/kg	NA		**5.1**	J-	NA		502	J-	NA		29.6	J-	NA		NA		NA	
WSC-25-SED-0	02/23/06	08/24/07	Surface	REG	mg/kg	NA		**5.0**	J-	NA		612	J-	NA		28.7	J-	NA		NA		NA	
WSC-26-SED-0	02/23/06	08/24/07	Surface	REG	mg/kg	NA		**6.3**	J-	NA		267	J-	NA		26.9	J-	NA		NA		NA	
WSC-27-SED-0	02/23/06	08/24/07	Surface	REG	mg/kg	NA		**3.5**	J-	NA		430	J-	NA		23.3	J-	NA		NA		NA	
WSC-28-SED-0	02/23/06	08/24/07	Surface	REG	mg/kg	NA		**4.7**	J-	NA		469	J-	NA		26.2	J-	NA		NA		NA	
WSC-29-SED-0	02/23/06	08/28/07	Surface	REG	mg/kg	NA		**7.8**	J-	NA		964	J-	NA		35.9	J-	NA		NA		NA	
WSC-29-SED-0	02/23/06	08/28/07	Surface	FD	mg/kg	NA		**5.4**	J-	NA		820	J-	NA		32.3	J-	NA		NA		NA	
WSC-30-SED-0	02/23/06	08/28/07	Surface	REG	mg/kg	NA		**4.0**	J-	NA		259	J-	NA		14.7	J-	NA		NA		NA	
WSC-31-SED-0	02/23/06	02/24/06	Surface	REG	mg/kg	1	J	**4**		0.69		454		14,900		23.2		2.2		0.71	U	37.3	
WSC-32-SED-0	02/23/06	08/28/07	Surface	REG	mg/kg	NA		**5.2**	J-	NA		405	J-	NA		22.8	J-	NA		NA		NA	
WSC-33-SED-0	02/23/06	08/28/07	Surface	REG	mg/kg	NA		**4.7**	J-	NA		264	J-	NA		11.3	J-	NA		NA		NA	
WSC-34-SED-0	02/23/06	08/28/07	Surface	REG	mg/kg	NA		**3.0**	J-	NA		113	J-	NA		6.1	J-	NA		NA		NA	

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Arizona Residential Soil Remediation Level[1] (mg/kg):						**31**		**10**		**39**		**3,100**		**--**		**400**		**390**		**5.2**		**78**	
EPA Region IX Preliminary Remediation Goal[2] (mg/kg):						**31**		**0.39**		**37**		**3,100**		**23,000**		**400**		**390**		**5.2**		**78**	
Location/	**Sample**	**Shipment**		**Sample**		**Antimony**		**Arsenic**		**Cadmium**		**Copper**		**Iron**		**Lead**		**Molybdenum**		**Thallium**		**Vanadium**	
Parcel ID	**Date**	**Date**	**Depth**	**Type**	**Units**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**
WSC-35-SED-0	02/23/06	08/28/07	Surface	REG	mg/kg	NA		**4.3**	J-	NA		282	J-	NA		20.8	J-	NA		NA		NA	
WSC-36-SED-0	02/23/06	08/28/07	Surface	REG	mg/kg	NA		**1.9**	J-	NA		229	J-	NA		12.0	J-	NA		NA		NA	
WSC-37-SED-0	02/23/06	08/28/07	Surface	REG	mg/kg	NA		**3.4**	J-	NA		116	J-	NA		17.2	J-	NA		NA		NA	
WSC-38-SED-0	02/23/06	08/28/07	Surface	REG	mg/kg	NA		**5.6**	J-	NA		653	J-	NA		48.2	J-	NA		NA		NA	
Winkelman School Housing Area A:																							
WSCLA-01-SED-0	02/24/06	02/24/06	Surface	REG	mg/kg	0.7	J	**5.3**		0.56		448		13,800		25.1	J	1.9		0.56	UJ	26.8	
WSCLA-03-SED-0	02/24/06	08/28/07	Surface	REG	mg/kg	NA		**7.8**	J-	NA		568	J-	NA		47.9	J-	NA		NA		NA	
WSCLA-04-SED-0	02/24/06	08/28/07	Surface	REG	mg/kg	NA		**9.1**	J-	NA		489	J-	NA		31.2	J-	NA		NA		NA	
WSCLA-04-SED-0	02/24/06	08/28/07	Surface	FD	mg/kg	NA		**7.5**	J-	NA		495	J-	NA		31.3	J-	NA		NA		NA	
WSCLA-05-SED-0	02/24/06	08/28/07	Surface	REG	mg/kg	NA		**10.3**	J-	NA		2,480	J-	NA		84.5	J-	NA		NA		NA	
WSCLA-07-SED-0	02/24/06	08/28/07	Surface	REG	mg/kg	NA		**8.3**	J-	NA		2,670	J-	NA		91.4	J-	NA		NA		NA	
WSCLA-08-SED-0	02/24/06	08/28/07	Surface	REG	mg/kg	NA		**4.3**	J-	NA		193	J-	NA		24.2	J-	NA		NA		NA	
WSCLA-09-SED-0	02/24/06	08/28/07	Surface	REG	mg/kg	NA		**9.7**	J-	NA		205	J-	NA		24.7	J-	NA		NA		NA	
WSCLA-09-SED-1	02/24/06	08/28/07	Subsurface	REG	mg/kg	NA		**5.5**	J-	NA		49.3	J-	NA		16.5	J-	NA		NA		NA	
Winkelman School Housing Area B:																							
WSCLB-01-SED-0	02/24/06	08/28/07	Surface	REG	mg/kg	NA		**7.5**	J-	NA		144	J-	NA		23.6	J-	NA		NA		NA	
WSCLB-01-SED-0	02/24/06	08/28/07	Surface	FD	mg/kg	NA		**6.4**	J-	NA		126	J-	NA		21.4	J-	NA		NA		NA	
WSCLB-02-SED-0	02/24/06	02/24/06	Surface	REG	mg/kg	0.55	J	**3.8**		0.44	UJ	369		13,900		23.3	J	1.4		0.42	UJ	27.9	
WSCLB-02-SED-1	02/24/06	08/28/07	Subsurface	REG	mg/kg	NA		**6.3**	J-	NA		85.2	J-	NA		18.4	J-	NA		NA		NA	
WSCLB-03-SED-0	02/24/06	08/28/07	Surface	REG	mg/kg	NA		**5.2**	J-	NA		302	J-	NA		24.9	J-	NA		NA		NA	
WSCLB-04-SED-0	02/24/06	08/28/07	Surface	REG	mg/kg	NA		**7.2**	J-	NA		113	J-	NA		21.1	J-	NA		NA		NA	
WSCLB-05-SED-0	02/24/06	08/28/07	Surface	REG	mg/kg	NA		**5.3**	J-	NA		542	J-	NA		30.1	J-	NA		NA		NA	
WSCLB-06-SED-0	02/24/06	08/28/07	Surface	REG	mg/kg	NA		**6.5**	J-	NA		1,380	J-	NA		38.7	J-	NA		NA		NA	
WSCLB-07-SED-0	02/24/06	08/28/07	Surface	REG	mg/kg	NA		**6.5**	J-	NA		1,270	J-	NA		38.0	J-	NA		NA		NA	
WSCLB-08-SED-0	02/24/06	08/28/07	Surface	REG	mg/kg	NA		**6.1**	J-	NA		668	J-	NA		27.0	J-	NA		NA		NA	
WSCLB-09-SED-0	02/24/06	08/28/07	Surface	REG	mg/kg	NA		**3.5**	J-	NA		715	J-	NA		29.3	J-	NA		NA		NA	
Winkelman School Housing Area C:																							
WSCLC-01-SED-0	02/24/06	08/28/07	Surface	REG	mg/kg	NA		**3.5**	J-	NA		350	J-	NA		19.4	J-	NA		NA		NA	
WSCLC-01-SED-0	02/24/06	08/28/07	Surface	FD	mg/kg	NA		**5.8**	J-	NA		326	J-	NA		19.7	J-	NA		NA		NA	
WSCLC-02-SED-0	02/24/06	08/28/07	Surface	REG	mg/kg	NA		**4.2**	J-	NA		501	J-	NA		19.6	J-	NA		NA		NA	
WSCLC-03-SED-0	02/24/06	02/24/06	Surface	REG	mg/kg	0.58	J	**1.9**		0.29	UJ	181		15,400		24.3	J	1.2		0.71	UJ	28.4	
WSCLC-04-SED-0	02/24/06	08/28/07	Surface	REG	mg/kg	NA		**4.4**	J-	NA		174	J-	NA		15.8	J-	NA		NA		NA	
WSCLC-05-SED-0	02/24/06	08/28/07	Surface	REG	mg/kg	NA		**6.2**	J-	NA		203	J-	NA		14.8	J-	NA		NA		NA	
WSCLC-05-SED-1	02/24/06	08/28/07	Subsurface	REG	mg/kg	NA		**2.8**	J-	NA		71.6	J-	NA		11.9	J-	NA		NA		NA	
WSCLC-06-SED-0	02/24/06	08/28/07	Surface	REG	mg/kg	NA		**2.6**	J-	NA		64.3	J-	NA		9.6	J-	NA		NA		NA	

TABLE 4-7
Soil Sampling Laboratory Value Exceedances for Full Inorganic Target Analyte List
Non-Residential Properties
Remedial Investigation Report
ASARCO LLC Hayden, Arizona Plant Site

The data in this table are illustrated on figures 4-2, 4-3, 4-4, 4-5, 4-6, 4-7, 4-8, 4-9, 4-10, 4-11, 4-12, 4-14, and 4-16.

Arizona Residential Soil Remediation Level[1] (mg/kg):						**31**		**10**		**39**		**3,100**		**--**		**400**		**390**		**5.2**		**78**	
EPA Region IX Preliminary Remediation Goal[2] (mg/kg):						**31**		**0.39**		**37**		**3,100**		**23,000**		**400**		**390**		**5.2**		**78**	
Location/	**Sample**	**Shipment**		**Sample**		**Antimony**		**Arsenic**		**Cadmium**		**Copper**		**Iron**		**Lead**		**Molybdenum**		**Thallium**		**Vanadium**	
Parcel ID	**Date**	**Date**	**Depth**	**Type**	**Units**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**
WSCLC-07-SED-0	02/24/06	08/28/07	Surface	REG	mg/kg	NA		**6.9**	J-	NA		930	J-	NA		37.0	J-	NA		NA		NA	
WSCLC-08-SED-0	02/24/06	08/28/07	Surface	REG	mg/kg	NA		**5.0**	J-	NA		418	J-	NA		20.6	J-	NA		NA		NA	
WSCLC-09-SED-0	02/24/06	08/28/07	Surface	REG	mg/kg	NA		**5.0**	J-	NA		659	J-	NA		30.7	J-	NA		NA		NA	
Minimum Detected Result:						0.21		**1.3**		0.03		16.6		4,340		3.4		0.12		0.2		6.9	
Maximum Detected Result:						**38.2**		**1,720**		**94.7**		**380,000**		**320,000**		**1,230**		**2,280**		**5.9**		**105**	
Arithmetic Mean Detected Result:						5.32		**34.08**		7.44		**11,204.35**		**50,797.45**		82.47		253.69		1.55		50.74	

Table Notes:

[1] Arizona Department of Environmental Quality Residential Soil Remediation Levels, Title 18 Chapter 7, January 2008
[2] EPA Region IX Preliminary Remediation Goals, Residential Soil, October 2004
[3] Bold values with bold outline exceed one or more of the comparison criteria.
[4] Bold italicized values have detection limits above one or more of the comparison criteria.
[5] -- = Not established
[6] FD = Field duplicate
[7] J = Estimated value
[8] J+ = Estimated value, may be biased high
[9] J- = Estimated value, may be biased low
[10] mg/kg = milligrams per kilogram
[11] NA = Not analyzed
[12] REG = Regular sample
[13] Subsurface = The sample was collected approximately 10-12 inches below surface.
[14] Surface = The sample was collected approximately 0-2 inches below surface.
[15] U = Not detected; reporting limit is shown in place of a result.
[16] UJ = Not detected; reporting limit is approximate and is shown in place of a result.

TABLE 4-8

Summary of Soil Sampling Laboratory Values Mean, Maximum and 95% Upper Confidence Level for Arsenic, Copper and Lead
Hayden Residential Properties
Remedial Investigation Report
ASARCO LLC Hayden, Arizona Plant Site

The data in this table are illustrated on figures 4-12, 4-14, and 4-16.

Arizona Residential Soil Remediation Level[1] (mg/kg):		**10**			**3,100**			**400**		
EPA Region IX Preliminary Remediation Goal[2] (mg/kg):		**0.39**			**3,100**			**400**		
		Arsenic			**Copper**			**Lead**		
Parcel Number	**Units**	**Mean Detected**	**Maximum Detected**	**95% UCL**	**Mean Detected**	**Maximum Detected**	**95% UCL**	**Mean Detected**	**Maximum Detected**	**95% UCL**
101-07-008	mg/kg	**51.3**	**113**	**68.9**	**11,700**	**20,200**	**14,400**	347	**810**	**470**
101-07-010	mg/kg	**30.2**	**51.5**	**38.9**	**8,820**	**15,700**	**11,200**	202	**450**	290
101-07-014	mg/kg	**25.7**	**53.7**	**37.8**	**8,020**	**13,400**	**10,200**	**417**	**705**	**549**
101-07-018	mg/kg	**27.8**	**56.4**	**36.7**	**6,410**	**11,000**	**7,770**	**531**	**1,290**	**947**
101-07-027	mg/kg	**23.8**	**35.4**	**28.8**	**6,010**	**8,870**	**6,970**	166	237	192
101-07-028	mg/kg	**35.8**	**56.5**	**44.7**	**8,320**	**17,500**	**12,400**	310	**1,180**	**644**
101-07-029	mg/kg	**44.3**	**62.1**	**51.9**	**9,680**	**17,800**	**12,100**	363	**691**	**483**
101-07-030	mg/kg	**24.1**	**41.2**	**32.1**	**9,290**	**18,100**	**12,900**	177	333	238
101-07-034	mg/kg	**37.9**	**123**	**84.5**	**10,400**	**32,700**	**16,200**	330	**788**	**536**
101-07-035AE	mg/kg	**34.5**	**72.1**	**49.6**	**8,310**	**17,500**	**12,100**	139	376	214
101-07-035AN	mg/kg	**27**	**67.3**	**55.7**	**12,900**	**31,100**	**17,900**	84.4	156	116
101-07-035AS	mg/kg	**24.6**	**30**	**27.9**	**17,300**	**42,100**	**25,100**	153	285	204
101-07-037	mg/kg	**43**	**83.6**	**56.1**	**12,500**	**23,900**	**16,500**	**658**	**3,270**	**1,470**
101-07-040	mg/kg	**37**	**98.3**	**54.5**	**14,000**	**41,800**	**23,400**	144	362	217
101-07-041	mg/kg	**14.6**	**23.1**	**17.6**	**3,340**	**5,870**	**4,070**	184	294	219
101-07-042	mg/kg	**15.3**	**25**	**20.1**	**3,750**	**6,540**	**4,850**	225	399	303
101-07-046	mg/kg	**14.1**	**35.3**	**20.3**	**3,140**	**6,240**	**4,330**	**492**	**1,270**	**734**
101-07-047	mg/kg	**31.6**	**69.3**	**42.3**	**8,290**	**16,100**	**10,500**	**495**	**915**	**755**
101-07-050A	mg/kg	**12.7**	**22.1**	**16.3**	**3,790**	**4,970**	**4,260**	109	200	142
101-07-052	mg/kg	**27.7**	**56.2**	**36.6**	**8,750**	**15,900**	**11,400**	174	363	237
101-07-060	mg/kg	**18.4**	**31.9**	**22.3**	**5,480**	**8,120**	**6,580**	264	**1,010**	**676**
101-07-061	mg/kg	**16.6**	**44.3**	**27.6**	**4,280**	**8,990**	**5,680**	88.6	276	210
101-07-062	mg/kg	**24.7**	**58.5**	**43.4**	**6,510**	**13,600**	**8,860**	126	268	239

TABLE 4-8

Summary of Soil Sampling Laboratory Values Mean, Maximum and 95% Upper Confidence Level for Arsenic, Copper and Lead
Hayden Residential Properties
Remedial Investigation Report
ASARCO LLC Hayden, Arizona Plant Site

The data in this table are illustrated on figures 4-12, 4-14, and 4-16.

Arizona Residential Soil Remediation Level[1] (mg/kg):		**10**			**3,100**			**400**		
EPA Region IX Preliminary Remediation Goal[2] (mg/kg):		**0.39**			**3,100**			**400**		
		Arsenic			**Copper**			**Lead**		
Parcel Number	**Units**	**Mean Detected**	**Maximum Detected**	**95% UCL**	**Mean Detected**	**Maximum Detected**	**95% UCL**	**Mean Detected**	**Maximum Detected**	**95% UCL**
101-07-065	mg/kg	**11.9**	**18.7**	**15.3**	1,880	**3,910**	2,560	326	**1,280**	**736**
101-07-066	mg/kg	**9.64**	**15.5**	**12.2**	2,560	**4,740**	**3,310**	**537**	**3,180**	**3,180**
101-07-082	mg/kg	**19.7**	**30.7**	**24.5**	**3,800**	**6,580**	**4,680**	200	370	272
101-07-089K	mg/kg	**50**	**157**	**87.2**	**9,100**	**14,800**	**10,900**	314	**1,530**	**662**
101-07-089Q	mg/kg	**25.3**	**58.6**	**37.7**	**12,400**	**45,900**	**11,100**	89.2	259	156
101-07-089S	mg/kg	**53**	**87.9**	**66.5**	**15,800**	**25,200**	**20,600**	184	276	230
101-07-089T	mg/kg	**149**	**865**	**540**	**15,200**	**23,400**	**19,500**	199	**436**	265
101-07-089U	mg/kg	**40.8**	**59.9**	**50.2**	**13,900**	**20,900**	**17,300**	129	236	163
101-07-090	mg/kg	**37.3**	**68.9**	**48.4**	**13,000**	**21,200**	**16,100**	189	319	241
101-07-091	mg/kg	**28.3**	**72.9**	**45**	**10,200**	**33,300**	**22,300**	124	358	250
101-07-092A	mg/kg	**22.8**	**44.1**	**31.3**	**7,640**	**14,400**	**10,100**	146	276	208
101-07-099	mg/kg	**43.3**	**91.9**	**58**	**11,600**	**18,000**	**14,800**	296	**688**	**406**
101-07-104	mg/kg	**18**	**25.4**	**21.4**	**6,960**	**18,800**	**10,900**	156	**630**	297
101-07-105	mg/kg	**27.1**	**44.4**	**33.6**	**10,500**	**31,600**	**17,100**	**414**	**1,740**	**867**
101-07-110	mg/kg	**10.6**	**25.1**	**14.6**	**3,690**	**7,550**	**5,050**	40.5	93	56.2
101-07-111	mg/kg	**11.6**	**21.3**	**15.3**	**4,670**	**9,500**	**6,400**	71.2	150	100
101-07-117	mg/kg	**29.6**	**42.6**	**36**	**8,720**	**13,800**	**11,300**	242	389	312
101-07-129	mg/kg	**20.2**	**33.7**	**25.6**	**5,120**	**9,620**	**6,500**	218	348	281
101-07-142A	mg/kg	**10.8**	**31.5**	**16.6**	1,620	**4,690**	2,520	84.5	185	124
101-07-149	mg/kg	**16**	**33.6**	**20.8**	**3,870**	**10,300**	**5,660**	175	**424**	252
101-07-176	mg/kg	**34.9**	**213**	**132**	2,520	**5,600**	**3,410**	93.9	213	127
101-07-185C	mg/kg	**8.29**	**9.8**	**9.02**	1,510	2,450	1,830	46.1	57.5	51.8
101-07-193A	mg/kg	**12.5**	**16.8**	**14.4**	1,770	2,430	2,090	94.6	173	119

TABLE 4-8

Summary of Soil Sampling Laboratory Values Mean, Maximum and 95% Upper Confidence Level for Arsenic, Copper and Lead
Hayden Residential Properties
Remedial Investigation Report
ASARCO LLC Hayden, Arizona Plant Site

The data in this table are illustrated on figures 4-12, 4-14, and 4-16.

Arizona Residential Soil Remediation Level[1] (mg/kg):		**10**			**3,100**			**400**		
EPA Region IX Preliminary Remediation Goal[2] (mg/kg):		**0.39**			**3,100**			**400**		
		Arsenic			**Copper**			**Lead**		
Parcel Number	**Units**	**Mean Detected**	**Maximum Detected**	**95% UCL**	**Mean Detected**	**Maximum Detected**	**95% UCL**	**Mean Detected**	**Maximum Detected**	**95% UCL**
101-07-202	mg/kg	**7.5**	**15.3**	**10.8**	1,250	3,040	1,870	63.6	119	90.2
101-07-216	mg/kg	**14.1**	**35.8**	**20.7**	1,740	2,520	2,230	286	**1,100**	**571**
101-07-219	mg/kg	**16.3**	**25.8**	**20**	**3,350**	**4,910**	**4,000**	125	212	152
101-07-234	mg/kg	**8.68**	**13.3**	**10.2**	2,260	**4,150**	2,790	97.6	352	169
101-07-236	mg/kg	**19.5**	**50.6**	**28.4**	**4,060**	**7,900**	**5,290**	182	381	236
101-07-242	mg/kg	**14.9**	**21.3**	**16.9**	**3,280**	**6,530**	**4,510**	120	168	142
101-07-244	mg/kg	**9.34**	**14.4**	**11.3**	2,310	**4,270**	2,920	122	196	154
101-07-247	mg/kg	**8.19**	**12.5**	**10.2**	2,020	**3,200**	2,550	232	**840**	**431**
101-07-251	mg/kg	**12.8**	**24.2**	**16.3**	3,060	**4,480**	**3,760**	144	238	185
101-07-259	mg/kg	**9.96**	**17.2**	**13.4**	2,420	**4,980**	**3,350**	77	167	105
101-07-270	mg/kg	**39.7**	**80.3**	**57.7**	**10,600**	**17,500**	**17,500**	**513**	**1,340**	**1,080**
101-07-284	mg/kg	**15.8**	**20.7**	**18**	**5,740**	**7,100**	**6,480**	143	224	170
101-07-286	mg/kg	**18**	**23.8**	**20.4**	**5,520**	**8,230**	**6,930**	180	262	225
101-07-301	mg/kg	**20.2**	**24.6**	**22.5**	**8,070**	**12,000**	**9,400**	248	**941**	**627**
101-07-303	mg/kg	**10.9**	**20.7**	**14.2**	**4,710**	**17,200**	**10,500**	89.5	258	152
101-07-304A	mg/kg	**17.9**	**34.8**	**24.6**	**4,520**	**10,700**	**6,550**	97.4	195	133
101-09-004	mg/kg	**29.6**	**48.5**	**37**	**5,710**	**8,870**	**7,320**	**1,200**	**8,170**	**8,170**
101-09-008	mg/kg	**36.5**	**57.1**	**47.6**	**7,490**	**17,800**	**10,800**	265	**525**	358
101-09-010	mg/kg	**24.6**	**41.7**	**30.1**	**5,780**	**8,120**	**7,030**	369	**1,140**	**799**
101-09-014	mg/kg	**15.5**	**31.5**	**20**	**4,050**	**6,750**	**5,180**	272	**558**	368
101-09-025A	mg/kg	**14.6**	**33.7**	**19.9**	**4,200**	**9,970**	**5,970**	180	281	227
101-09-027	mg/kg	**16.7**	**27.3**	**20.8**	**3,470**	**6,840**	**4,650**	**403**	**1,190**	**616**
101-09-032	mg/kg	**27.8**	**40.8**	**33.1**	**6,920**	**9,940**	**8,490**	396	**591**	**481**

TABLE 4-8

Summary of Soil Sampling Laboratory Values Mean, Maximum and 95% Upper Confidence Level for Arsenic, Copper and Lead
Hayden Residential Properties
Remedial Investigation Report
ASARCO LLC Hayden, Arizona Plant Site

The data in this table are illustrated on figures 4-12, 4-14, and 4-16.

Arizona Residential Soil Remediation Level[1] (mg/kg):		**10**			**3,100**			**400**		
EPA Region IX Preliminary Remediation Goal[2] (mg/kg):		**0.39**			**3,100**			**400**		
		Arsenic			**Copper**			**Lead**		
Parcel Number	**Units**	**Mean Detected**	**Maximum Detected**	**95% UCL**	**Mean Detected**	**Maximum Detected**	**95% UCL**	**Mean Detected**	**Maximum Detected**	**95% UCL**
101-09-033	mg/kg	**39.9**	**89.1**	**53.4**	**7,570**	**17,500**	**10,300**	**580**	**1,610**	**972**
101-09-036	mg/kg	**23.9**	**49.3**	**32.1**	**5,230**	**9,680**	**7,000**	**1,150**	**3,710**	**2,330**
101-09-038	mg/kg	**56.8**	**116**	**78.7**	**10,600**	**17,200**	**14,300**	318	**557**	**422**
101-09-039	mg/kg	**16.2**	**32.5**	**22.3**	**4,680**	**12,600**	**6,890**	**737**	**5,210**	**3,010**
101-09-042	mg/kg	**14.7**	**26**	**17.7**	**4,070**	**7,110**	**4,960**	347	**491**	398
101-09-045	mg/kg	**17.8**	**31.5**	**22.6**	**4,050**	**6,360**	**5,010**	110	192	137
101-09-047	mg/kg	**18.7**	**28.5**	**22.2**	**5,260**	**12,400**	**7,330**	**606**	**1,170**	**961**
101-09-054	mg/kg	**21.9**	**29.9**	**25.7**	**5,940**	**8,880**	**7,480**	**551**	**783**	**676**
101-09-059	mg/kg	**10.5**	**19.7**	**13.8**	**3,930**	**9,390**	**5,520**	303	**1,350**	**727**
101-09-062	mg/kg	**18.7**	**31.8**	**24.4**	**3,830**	**5,460**	**4,590**	**539**	**1,070**	**712**
101-09-064	mg/kg	**30**	**74.7**	**42.7**	**7,770**	**18,500**	**11,100**	232	**434**	**412**
101-09-067	mg/kg	**32.3**	**44.8**	**37**	**5,410**	**6,890**	**5,970**	**667**	**1,390**	**909**
101-09-068	mg/kg	**15.9**	**33.1**	**20.7**	**3,340**	**5,740**	**4,130**	199	**512**	296
101-09-070	mg/kg	**20.6**	**32.7**	**25.9**	**6,280**	**13,400**	**8,510**	**832**	**4,860**	**3,030**
101-09-072	mg/kg	**23.5**	**34.8**	**29**	**6,850**	**11,800**	**8,430**	280	**1,030**	**518**
101-09-077	mg/kg	**35.5**	**66.3**	**45.7**	**5,630**	**8,110**	**6,550**	**1,260**	**7,250**	**7,250**
101-09-083	mg/kg	**17.4**	**69.5**	**33.6**	3,020	**11,900**	**5,910**	350	**536**	**459**
101-09-084	mg/kg	**30.3**	**45.6**	**36.7**	**6,660**	**9,290**	**7,900**	**922**	**1,840**	**1,220**
101-09-088	mg/kg	**13.2**	**32.3**	**19.1**	1,890	**4,060**	2,690	**10,500**	**92,600**	**92,600**
101-09-104	mg/kg	**36.4**	**53.4**	**42.9**	**10,100**	**19,700**	**12,700**	354	**661**	**471**
101-09-106	mg/kg	**37.5**	**88.3**	**52.4**	**10,100**	**15,800**	**12,000**	**658**	**2,990**	**1,350**
101-09-107	mg/kg	**30.3**	**41.3**	**35.5**	**7,030**	**13,100**	**8,700**	**432**	**841**	**574**
101-09-108	mg/kg	**45.7**	**62.6**	**52.3**	**12,100**	**20,600**	**15,800**	**813**	**2,470**	**1,600**

TABLE 4-8

Summary of Soil Sampling Laboratory Values Mean, Maximum and 95% Upper Confidence Level for Arsenic, Copper and Lead
Hayden Residential Properties
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The data in this table are illustrated on figures 4-12, 4-14, and 4-16.

Arizona Residential Soil Remediation Level[1] (mg/kg):		**10**			**3,100**			**400**		
EPA Region IX Preliminary Remediation Goal[2] (mg/kg):		**0.39**			**3,100**			**400**		
		Arsenic			**Copper**			**Lead**		
Parcel Number	**Units**	**Mean Detected**	**Maximum Detected**	**95% UCL**	**Mean Detected**	**Maximum Detected**	**95% UCL**	**Mean Detected**	**Maximum Detected**	**95% UCL**
101-09-109	mg/kg	**31.1**	**50.9**	**38.2**	**11,800**	**15,800**	**14,400**	328	**867**	**590**
101-09-111B	mg/kg	**47.4**	**79.9**	**60.5**	**10,700**	**18,200**	**13,800**	255	**687**	385
101-09-115	mg/kg	**27.2**	**43.2**	**33.6**	**6,110**	**9,010**	**7,430**	215	355	273
101-09-120	mg/kg	**32.3**	**51.9**	**40.6**	**6,180**	**9,980**	**7,980**	173	319	231
101-09-134	mg/kg	**12.5**	**32.4**	**19.1**	2,860	**11,200**	**6,010**	59.7	144	85.9
101-09-137	mg/kg	**25.7**	**41.1**	**30.8**	**3,950**	**8,140**	**5,570**	78.4	158	105
101-09-140	mg/kg	**68.5**	**294**	**221**	**17,100**	**76,600**	**39,700**	322	**1,370**	**779**

Table Notes:

[1] Arizona Department of Environmental Quality Residential Soil Remediation Levels, Title 18 Chapter 7, January 2

[2] EPA Region IX Preliminary Remediation Goals, Residential Soil, October 20(

[3] Bold values with bold outline exceed one or more of the comparison criter

[4] mg/kg = milligrams per kilogran

TABLE 4-9
Soil Sampling Laboratory Value Exceedances for Full Inorganic Target Analyte List
Hayden Residential Properties
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The data in this table are illustrated on figures 4-5, 4-13, 4-15, 4-17, 4-63, 4-64, 4-65, 4-66, 4-67, 4-68, and 4-69.

Arizona Residential Soil Remediation Level[1] (mg/kg):						**31**		**10**		**39**		**3,100**		**--**		**400**		**390**		**78**	
EPA Region IX Preliminary Remediation Goal[2] (mg/kg):						**31**		**0.39**		**37**		**3,100**		**23,000**		**400**		**390**		**78**	
Location/	**Sample**	**Shipment**		**Sample**		**Antimony**		**Arsenic**		**Cadmium**		**Copper**		**Iron**		**Lead**		**Silver**		**Vanadium**	
Parcel ID	**Date**	**Date**	**Depth**	**Type**	**Units**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**
HSS-A-0-101-07-008	02/09/06	11/20/06	Surface	REG	mg/kg	NA		**19.7**	J-	NA		**6,560**	J-	NA		258	J-	NA		NA	
HSS-A-0-101-07-010	02/09/06	11/20/06	Surface	REG	mg/kg	NA		**51.5**	J-	NA		**15,700**	J-	NA		282	J-	NA		NA	
HSS-A-0-101-07-014	02/03/06	11/27/06	Surface	REG	mg/kg	NA		**53.7**	J-	NA		**13,400**	J-	NA		**579**	J-	NA		NA	
HSS-A-0-101-07-014	02/03/06	11/27/06	Surface	FD	mg/kg	NA		**53.6**	J-	NA		**13,300**	J-	NA		**548**	J-	NA		NA	
HSS-A-0-101-07-018	02/06/06	11/27/06	Surface	REG	mg/kg	NA		**13.7**	J-	NA		2,760	J-	NA		263	J-	NA		NA	
HSS-A-0-101-07-027	02/06/06	08/21/07	Surface	REG	mg/kg	NA		**26.4**	J-	NA		**7,640**	J-	NA		157	J-	NA		NA	
HSS-A-0-101-07-027	02/06/06	08/21/07	Surface	FD	mg/kg	NA		**24.8**	J-	NA		**7,000**	J-	NA		148	J-	NA		NA	
HSS-A-0-101-07-028	02/06/06	11/20/06	Surface	REG	mg/kg	NA		**52.6**	J-	NA		**6,430**	J-	NA		195	J-	NA		NA	
HSS-A-0-101-07-029	02/06/06	11/20/06	Surface	REG	mg/kg	NA		**52.1**	J-	NA		**10,400**	J-	NA		311	J-	NA		NA	
HSS-A-0-101-07-030	02/06/06	02/08/06	Surface	REG	mg/kg	1.2	J	**8.8**		2.6		**3,680**		14,900		88.5		3.1		27.2	
HSS-A-0-101-07-030	02/06/06	11/27/06	Surface	REG	mg/kg	NA		**12.8**	J-	NA		**3,740**	J-	NA		91.5	J-	NA		NA	
HSS-A-0-101-07-034	02/09/06	11/20/06	Surface	REG	mg/kg	NA		**33.8**	J-	NA		**10,800**	J-	NA		310	J-	NA		NA	
HSS-A-0-101-07-035AE	02/09/06	08/21/07	Surface	REG	mg/kg	NA		**42.6**	J-	NA		**10,900**	J-	NA		142	J-	NA		NA	
HSS-A-0-101-07-035AE	02/09/06	08/21/07	Surface	FD	mg/kg	NA		**49.3**	J-	NA		**10,300**	J-	NA		169	J-	NA		NA	
HSS-A-0-101-07-035AN	02/09/06	02/10/06	Surface	REG	mg/kg	2.7	J	***0.4***	U	3.5		**20,700**		**47,700**		47.1		3.9		60.7	
HSS-A-0-101-07-035AN	02/09/06	11/20/06	Surface	REG	mg/kg	NA		**17.3**		NA		**19,100**		NA		48.1	J	NA		NA	
HSS-A-0-101-07-035AS	02/09/06	11/20/06	Surface	REG	mg/kg	NA		**25.2**	J-	NA		**9,040**	J-	NA		270	J-	NA		NA	
HSS-A-0-101-07-037	02/03/06	02/03/06	Surface	REG	mg/kg	3.8	J	**53.8**		11.3		**20,700**		**30,100**		323		17.2		38.7	
HSS-A-0-101-07-037	02/03/06	11/20/06	Surface	REG	mg/kg	NA		**81.4**	J-	NA		**23,900**	J-	NA		398	J-	NA		NA	
HSS-A-0-101-07-037	02/03/06	09/14/07	Surface	REG	mg/kg	NA		**83.6**	J-	NA		**21,500**	J-	NA		361	J-	NA		NA	
HSS-A-0-101-07-040	02/03/06	11/20/06	Surface	REG	mg/kg	NA		**58.7**	J-	NA		**16,300**	J-	NA		180	J-	NA		NA	
HSS-A-0-101-07-041	02/03/06	08/21/07	Surface	REG	mg/kg	NA		**15.2**	J-	NA		**3,190**	J-	NA		152	J-	NA		NA	
HSS-A-0-101-07-041	02/03/06	08/21/07	Surface	FD	mg/kg	NA		**16.8**	J-	NA		**3,640**	J-	NA		174	J-	NA		NA	
HSS-A-0-101-07-042	02/03/06	08/21/07	Surface	REG	mg/kg	NA		**14.4**	J-	NA		**3,760**	J-	NA		190	J-	NA		NA	
HSS-A-0-101-07-046	02/06/06	08/21/07	Surface	REG	mg/kg	NA		**7.5**	J-	NA		2,010	J-	NA		303	J-	NA		NA	
HSS-A-0-101-07-047	02/06/06	11/27/06	Surface	REG	mg/kg	NA		**41.1**	J-	NA		**9,540**	J-	NA		351	J-	NA		NA	
HSS-A-0-101-07-047	02/06/06	11/27/06	Surface	FD	mg/kg	NA		**36.9**	J-	NA		**9,000**	J-	NA		339	J-	NA		NA	
HSS-A-0-101-07-050A	02/03/06	08/21/07	Surface	REG	mg/kg	NA		**22.1**	J-	NA		**3,550**	J-	NA		142	J-	NA		NA	
HSS-A-0-101-07-052	02/02/06	11/20/06	Surface	REG	mg/kg	NA		**27**	J-	NA		**9,980**	J-	NA		183	J-	NA		NA	
HSS-A-0-101-07-060	02/02/06	08/21/07	Surface	REG	mg/kg	NA		**15.9**	J-	NA		**6,830**	J-	NA		107	J-	NA		NA	
HSS-A-0-101-07-060	02/02/06	08/21/07	Surface	FD	mg/kg	NA		**15.4**	J-	NA		**5,650**	J-	NA		161	J-	NA		NA	
HSS-A-0-101-07-061	02/02/06	08/21/07	Surface	REG	mg/kg	NA		**11.5**	J-	NA		**3,970**	J-	NA		51.6	J-	NA		NA	
HSS-A-0-101-07-061	02/02/06	08/21/07	Surface	FD	mg/kg	NA		**7.4**	J-	NA		2,780	J-	NA		40.7	J-	NA		NA	
HSS-A-0-101-07-062	02/06/06	11/27/06	Surface	REG	mg/kg	NA		**10.1**		NA		**4,330**		NA		70.3	J	NA		NA	
HSS-A-0-101-07-065	02/06/06	08/22/07	Surface	REG	mg/kg	NA		**7.1**	J-	NA		465	J-	NA		27.2	J-	NA		NA	
HSS-A-0-101-07-065	02/06/06	08/22/07	Surface	FD	mg/kg	NA		**5.0**	J-	NA		453	J-	NA		23.1	J-	NA		NA	

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Arizona Residential Soil Remediation Level[1] (mg/kg):						**31**		**10**		**39**		**3,100**		**--**		**400**		**390**		**78**	
EPA Region IX Preliminary Remediation Goal[2] (mg/kg):						**31**		**0.39**		**37**		**3,100**		**23,000**		**400**		**390**		**78**	
Location/	**Sample**	**Shipment**		**Sample**		**Antimony**		**Arsenic**		**Cadmium**		**Copper**		**Iron**		**Lead**		**Silver**		**Vanadium**	
Parcel ID	**Date**	**Date**	**Depth**	**Type**	**Units**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**
HSS-A-0-101-07-082	02/06/06	08/21/07	Surface	REG	mg/kg	NA		**30.2**	J-	NA		**6,580**	J-	NA		370	J-	NA		NA	
HSS-A-0-101-07-082	02/06/06	08/21/07	Surface	FD	mg/kg	NA		**21.5**	J-	NA		**4,300**	J-	NA		240	J-	NA		NA	
HSS-A-0-101-07-089K	02/07/06	02/08/06	Surface	REG	mg/kg	2.7	J	**31.5**		4.9		**6,450**		22,800		107		67.8		43.4	
HSS-A-0-101-07-089Q	02/02/06	02/03/06	Surface	REG	mg/kg	1	J	**10.3**		2.4		**4,820**		17,300		59.4		3.7		37.5	
HSS-A-0-101-07-089Q	02/02/06	02/03/06	Surface	FD	mg/kg	1.2	J	**12.6**		2.9		**5,690**		21,800		72.5		4.5		49.6	
HSS-A-0-101-07-089S	02/07/06	02/08/06	Surface	REG	mg/kg	2.5	J	**38**		7.8		**17,900**		**27,700**		192		13.4		56.8	
HSS-A-0-101-07-089T	02/07/06	02/08/06	Surface	REG	mg/kg	4.3	J	**47.5**		9.8		**23,400**		**30,600**		249		20.7		50	
HSS-A-0-101-07-089U	02/07/06	11/20/06	Surface	REG	mg/kg	NA		**59.9**	J-	NA		**20,900**	J-	NA		236	J-	NA		NA	
HSS-A-0-101-07-090	02/02/06	11/20/06	Surface	REG	mg/kg	NA		**49.9**	J-	NA		**18,500**	J-	NA		272	J-	NA		NA	
HSS-A-0-101-07-091	02/02/06	11/20/06	Surface	REG	mg/kg	NA		**20.5**	J-	NA		**7,300**	J-	NA		57.5	J-	NA		NA	
HSS-A-0-101-07-092A	02/02/06	08/21/07	Surface	REG	mg/kg	NA		**35.7**	J-	NA		**11,800**	J-	NA		231	J-	NA		NA	
HSS-A-0-101-07-092A	02/02/06	08/21/07	Surface	FD	mg/kg	NA		**33.3**	J-	NA		**10,800**	J-	NA		208	J-	NA		NA	
HSS-A-0-101-07-099	02/01/06	11/20/06	Surface	REG	mg/kg	NA		**35.7**	J-	NA		**10,100**	J-	NA		241	J-	NA		NA	
HSS-A-0-101-07-104	02/01/06	08/21/07	Surface	REG	mg/kg	NA		**18.0**	J-	NA		**6,440**	J-	NA		107	J-	NA		NA	
HSS-A-0-101-07-104	02/01/06	08/21/07	Surface	FD	mg/kg	NA		**14.3**	J-	NA		**7,020**	J-	NA		98.7	J-	NA		NA	
HSS-A-0-101-07-105	02/01/06	11/27/06	Surface	REG	mg/kg	NA		**24.8**	J-	NA		**6,580**	J-	NA		126	J-	NA		NA	
HSS-A-0-101-07-105	02/02/06	02/03/06	Surface	REG	mg/kg	2.8	J	**14.9**		1.9		**4,420**		**28,500**		102		2.2		69.3	
HSS-A-0-101-07-110	02/02/06	08/21/07	Surface	REG	mg/kg	NA		**8.9**	J-	NA		**4,620**	J-	NA		39.5	J-	NA		NA	
HSS-A-0-101-07-110	02/02/06	08/21/07	Surface	FD	mg/kg	NA		**8.9**	J-	NA		**3,680**	J-	NA		36.2	J-	NA		NA	
HSS-A-0-101-07-111	02/01/06	02/03/06	Surface	REG	mg/kg	1.6	J	**18.3**		3.9		**9,500**		**23,300**		127		6.4		44.3	
HSS-A-0-101-07-117	02/01/06	11/27/06	Surface	REG	mg/kg	NA		**25.6**	J-	NA		**9,080**	J-	NA		211	J-	NA		NA	
HSS-A-0-101-07-129	02/01/06	08/21/07	Surface	REG	mg/kg	NA		**16.8**	J	NA		**5,220**		NA		320		NA		NA	
HSS-A-0-101-07-129	02/01/06	08/21/07	Surface	FD	mg/kg	NA		**17.7**	J	NA		**5,980**		NA		172		NA		NA	
HSS-A-0-101-07-142A	01/31/06	08/21/07	Surface	REG	mg/kg	NA		**7.5**	J	NA		1,460		NA		108		NA		NA	
HSS-A-0-101-07-142A	01/31/06	08/21/07	Surface	FD	mg/kg	NA		**11.7**	J	NA		1,960		NA		136		NA		NA	
HSS-A-0-101-07-149	01/31/06	08/22/07	Surface	REG	mg/kg	NA		**13.1**	J-	NA		2,980	J-	NA		94.6	J-	NA		NA	
HSS-A-0-101-07-149	01/31/06	08/22/07	Surface	FD	mg/kg	NA		**10.8**	J-	NA		2,620	J-	NA		72.5	J-	NA		NA	
HSS-A-0-101-07-176	01/31/06	11/20/06	Surface	REG	mg/kg	NA		**9.7**	J-	NA		**5,600**	J-	NA		63.3	J-	NA		NA	
HSS-A-0-101-07-176	01/31/06	11/20/06	Surface	FD	mg/kg	NA		**11.3**	J-	NA		2,490	J-	NA		69.9	J-	NA		NA	
HSS-A-0-101-07-185C	01/31/06	02/02/06	Surface	REG	mg/kg	0.87	J	**6.2**		1		914		17,400		37.5		1.5		43.7	
HSS-A-0-101-07-193A	01/31/06	08/22/07	Surface	REG	mg/kg	NA		**11.6**	J-	NA		1,680	J-	NA		75.4	J-	NA		NA	
HSS-A-0-101-07-193A	01/31/06	08/22/07	Surface	FD	mg/kg	NA		**10.9**	J-	NA		2,050	J-	NA		95.0	J-	NA		NA	
HSS-A-0-101-07-202	01/31/06	08/21/07	Surface	REG	mg/kg	NA		**3.0**	J-	NA		489	J-	NA		32.8	J-	NA		NA	
HSS-A-0-101-07-202	01/31/06	08/21/07	Surface	FD	mg/kg	NA		**3.0**	J-	NA		420	J-	NA		26.6	J-	NA		NA	
HSS-A-0-101-07-216	01/30/06	02/02/06	Surface	REG	mg/kg	0.99	J	**5.3**		1.6		1,160		15,900		72.5		0.78	J	27.8	
HSS-A-0-101-07-219	01/31/06	08/21/07	Surface	REG	mg/kg	NA		**16.6**	J-	NA		**4,910**	J-	NA		136	J-	NA		NA	

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EPA Region IX Preliminary Remediation Goal[2] (mg/kg):						**31**		**0.39**		**37**		**3,100**		**23,000**		**400**		**390**		**78**	
Location/	**Sample**	**Shipment**		**Sample**		**Antimony**		**Arsenic**		**Cadmium**		**Copper**		**Iron**		**Lead**		**Silver**		**Vanadium**	
Parcel ID	**Date**	**Date**	**Depth**	**Type**	**Units**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**
HSS-A-0-101-07-219	01/31/06	08/21/07	Surface	FD	mg/kg	NA		**19.5**	J-	NA		**4,820**	J-	NA		125	J-	NA		NA	
HSS-A-0-101-07-234	02/01/06	08/21/07	Surface	REG	mg/kg	NA		**7.1**	J-	NA		1,620	J-	NA		66.5	J-	NA		NA	
HSS-A-0-101-07-234	02/01/06	08/21/07	Surface	FD	mg/kg	NA		**5.3**	J-	NA		2,000	J-	NA		24.7	J-	NA		NA	
HSS-A-0-101-07-236	02/01/06	08/21/07	Surface	REG	mg/kg	NA		**16.3**	J-	NA		**4,900**	J-	NA		152	J-	NA		NA	
HSS-A-0-101-07-236	02/01/06	08/21/07	Surface	FD	mg/kg	NA		**15.8**	J-	NA		**4,770**	J-	NA		158	J-	NA		NA	
HSS-A-0-101-07-242	01/31/06	02/02/06	Surface	REG	mg/kg	1.6	J	**14.6**		1.5		647		20,200		120		0.42	J	52.5	
HSS-A-0-101-07-244	02/01/06	02/03/06	Surface	REG	mg/kg	0.78	J	**9.3**		2.2		1,780		17,000		105		1		33.1	
HSS-A-0-101-07-247	01/31/06	08/21/07	Surface	REG	mg/kg	NA		**8.1**	J-	NA		2,200	J-	NA		80.8	J-	NA		NA	
HSS-A-0-101-07-247	01/31/06	08/21/07	Surface	FD	mg/kg	NA		**7.5**	J-	NA		2,050	J-	NA		129	J-	NA		NA	
HSS-A-0-101-07-251	01/31/06	08/21/07	Surface	REG	mg/kg	NA		**12.4**	J-	NA		**3,220**	J-	NA		125	J-	NA		NA	
HSS-A-0-101-07-251	01/31/06	08/21/07	Surface	FD	mg/kg	NA		**15.1**	J-	NA		3,010	J-	NA		121	J-	NA		NA	
HSS-A-0-101-07-259	01/31/06	08/21/07	Surface	REG	mg/kg	NA		**11.8**	J-	NA		**3,820**	J-	NA		95.0	J-	NA		NA	
HSS-A-0-101-07-259	01/31/06	08/21/07	Surface	FD	mg/kg	NA		**13.6**	J-	NA		**4,980**	J-	NA		113	J-	NA		NA	
HSS-A-0-101-07-270	02/01/06	11/27/06	Surface	REG	mg/kg	NA		**13.9**	J-	NA		**5,210**	J-	NA		119	J-	NA		NA	
HSS-A-0-101-07-284	02/01/06	08/21/07	Surface	REG	mg/kg	NA		**15.7**	J-	NA		**6,180**	J-	NA		178	J-	NA		NA	
HSS-A-0-101-07-284	02/01/06	08/21/07	Surface	FD	mg/kg	NA		**17.7**	J-	NA		**7,100**	J-	NA		224	J-	NA		NA	
HSS-A-0-101-07-286	02/01/06	08/21/07	Surface	REG	mg/kg	NA		**23.3**	J-	NA		**7,520**	J-	NA		262	J-	NA		NA	
HSS-A-0-101-07-286	02/01/06	08/21/07	Surface	FD	mg/kg	NA		**21.8**	J-	NA		**7,920**	J-	NA		224	J-	NA		NA	
HSS-A-0-101-07-301	02/01/06	08/21/07	Surface	REG	mg/kg	NA		**18.7**	J-	NA		**5,780**	J-	NA		160	J-	NA		NA	
HSS-A-0-101-07-301	02/01/06	08/21/07	Surface	FD	mg/kg	NA		**18.3**	J-	NA		**5,260**	J-	NA		130	J-	NA		NA	
HSS-A-0-101-07-303	02/01/06	08/21/07	Surface	REG	mg/kg	NA		**20.7**	J-	NA		**3,970**	J-	NA		177	J-	NA		NA	
HSS-A-0-101-07-303	02/01/06	08/21/07	Surface	FD	mg/kg	NA		**14.7**	J-	NA		2,730	J-	NA		135	J-	NA		NA	
HSS-A-0-101-07-304A	02/01/06	08/21/07	Surface	REG	mg/kg	NA		**27.1**	J-	NA		**5,610**	J-	NA		109	J-	NA		NA	
HSS-A-0-101-07-304A	02/01/06	08/21/07	Surface	FD	mg/kg	NA		**23.8**	J-	NA		**6,750**	J-	NA		120	J-	NA		NA	
HSS-A-0-101-09-004	02/07/06	11/20/06	Surface	REG	mg/kg	NA		**26**	J-	NA		**4,810**	J-	NA		225	J-	NA		NA	
HSS-A-0-101-09-008	02/07/06	11/20/06	Surface	REG	mg/kg	NA		**52.2**	J-	NA		**8,870**	J-	NA		370	J-	NA		NA	
HSS-A-0-101-09-010	02/07/06	11/20/06	Surface	REG	mg/kg	NA		**29.7**	J-	NA		**8,070**	J-	NA		178	J-	NA		NA	
HSS-A-0-101-09-014	02/06/06	02/08/06	Surface	REG	mg/kg	1.3	J	**11.7**		2.5		**3,190**		21,100		196		1.7		44	
HSS-A-0-101-09-025A	02/07/06	02/08/06	Surface	REG	mg/kg	1.4	J	**13.8**		2.8		**3,550**		19,300		222		3		39.5	
HSS-A-0-101-09-027	02/07/06	08/21/07	Surface	REG	mg/kg	NA		**18.4**	J-	NA		**5,030**	J-	NA		358	J-	NA		NA	
HSS-A-0-101-09-027	02/07/06	08/21/07	Surface	FD	mg/kg	NA		**18.7**	J-	NA		**3,870**	J-	NA		365	J-	NA		NA	
HSS-A-0-101-09-032	02/07/06	11/27/06	Surface	REG	mg/kg	NA		**28.5**	J-	NA		**5,250**	J-	NA		**589**	J-	NA		NA	
HSS-A-0-101-09-033	02/06/06	02/08/06	Surface	REG	mg/kg	4.2	J	**69.4**		15.2		**15,900**		**32,500**		**1,610**		12.3		44.9	
HSS-A-0-101-09-033	02/06/06	11/27/06	Surface	REG	mg/kg	NA		**89.1**	J-	NA		**17,500**	J-	NA		**1,320**	J-	NA		NA	
HSS-A-0-101-09-036	02/09/06	11/20/06	Surface	REG	mg/kg	NA		**14.2**	J-	NA		1,670	J-	NA		84.1	J-	NA		NA	
HSS-A-0-101-09-038	02/09/06	11/20/06	Surface	REG	mg/kg	NA		**46.8**	J-	NA		**9,700**	J-	NA		320	J-	NA		NA	

TABLE 4-9
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Arizona Residential Soil Remediation Level[1] (mg/kg):						**31**		**10**		**39**		**3,100**		**--**		**400**		**390**		**78**	
EPA Region IX Preliminary Remediation Goal[2] (mg/kg):						**31**		**0.39**		**37**		**3,100**		**23,000**		**400**		**390**		**78**	
Location/	**Sample**	**Shipment**		**Sample**		**Antimony**		**Arsenic**		**Cadmium**		**Copper**		**Iron**		**Lead**		**Silver**		**Vanadium**	
Parcel ID	**Date**	**Date**	**Depth**	**Type**	**Units**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**
HSS-A-0-101-09-039	02/10/06	08/21/07	Surface	REG	mg/kg	NA		**29.8**	J-	NA		**7,080**	J-	NA		**447**	J-	NA		NA	
HSS-A-0-101-09-039	02/10/06	08/21/07	Surface	FD	mg/kg	NA		**24.5**	J-	NA		**6,860**	J-	NA		**452**	J-	NA		NA	
HSS-A-0-101-09-042	02/09/06	08/21/07	Surface	REG	mg/kg	NA		**16.0**	J-	NA		**5,400**	J-	NA		396	J-	NA		NA	
HSS-A-0-101-09-042	02/09/06	08/21/07	Surface	FD	mg/kg	NA		**15.2**	J-	NA		**5,170**	J-	NA		388	J-	NA		NA	
HSS-A-0-101-09-045	02/10/06	08/21/07	Surface	REG	mg/kg	NA		**27.3**	J-	NA		**3,250**	J-	NA		129	J-	NA		NA	
HSS-A-0-101-09-045	02/10/06	08/21/07	Surface	FD	mg/kg	NA		**31.5**	J-	NA		2,940	J-	NA		122	J-	NA		NA	
HSS-A-0-101-09-047	02/09/06	08/21/07	Surface	REG	mg/kg	NA		**10.6**	J-	NA		2,390	J-	NA		168	J-	NA		NA	
HSS-A-0-101-09-047	02/09/06	08/21/07	Surface	FD	mg/kg	NA		**12.1**	J-	NA		**3,440**	J-	NA		237	J-	NA		NA	
HSS-A-0-101-09-054	02/10/06	08/21/07	Surface	REG	mg/kg	NA		**19.1**	J-	NA		**3,490**	J-	NA		**648**	J-	NA		NA	
HSS-A-0-101-09-054	02/10/06	08/21/07	Surface	FD	mg/kg	NA		**17.8**	J-	NA		**3,580**	J-	NA		**565**	J-	NA		NA	
HSS-A-0-101-09-059	02/07/06	08/21/07	Surface	REG	mg/kg	NA		**10.7**	J-	NA		**3,390**	J-	NA		232	J-	NA		NA	
HSS-A-0-101-09-059	02/07/06	08/21/07	Surface	FD	mg/kg	NA		**12.0**	J-	NA		**3,860**	J-	NA		353	J-	NA		NA	
HSS-A-0-101-09-062	02/08/06	08/21/07	Surface	REG	mg/kg	NA		**16.6**	J-	NA		**4,860**	J-	NA		**456**	J-	NA		NA	
HSS-A-0-101-09-062	02/08/06	08/21/07	Surface	FD	mg/kg	NA		**19.0**	J-	NA		**4,480**	J-	NA		**426**	J-	NA		NA	
HSS-A-0-101-09-064	02/08/06	11/20/06	Surface	REG	mg/kg	NA		**28.9**		NA		**6,120**		NA		140		NA		NA	
HSS-A-0-101-09-067	02/08/06	11/20/06	Surface	REG	mg/kg	NA		**25.8**	J-	NA		**4,310**	J-	NA		**486**	J-	NA		NA	
HSS-A-0-101-09-068	02/08/06	02/10/06	Surface	REG	mg/kg	1.1	UJ	**7.4**		2.3		2,880		12,900		75.9		2.8		25.5	
HSS-A-0-101-09-070	02/07/06	11/20/06	Surface	REG	mg/kg	NA		**27.1**	J-	NA		**8,280**	J-	NA		**530**	J-	NA		NA	
HSS-A-0-101-09-072	02/07/06	08/21/07	Surface	REG	mg/kg	NA		**28.8**	J-	NA		**7,790**	J-	NA		**1,030**	J-	NA		NA	
HSS-A-0-101-09-072	02/07/06	08/21/07	Surface	FD	mg/kg	NA		**26.6**	J-	NA		**7,530**	J-	NA		**730**	J-	NA		NA	
HSS-A-0-101-09-077	02/08/06	11/20/06	Surface	REG	mg/kg	NA		**20.9**	J-	NA		**4,410**	J-	NA		230	J-	NA		NA	
HSS-A-0-101-09-083	02/10/06	08/21/07	Surface	REG	mg/kg	NA		**7.0**	J-	NA		1,220	J-	NA		348	J-	NA		NA	
HSS-A-0-101-09-083	02/10/06	08/21/07	Surface	FD	mg/kg	NA		**16.8**	J-	NA		1,280	J-	NA		**437**	J-	NA		NA	
HSS-A-0-101-09-084	02/10/06	11/20/06	Surface	REG	mg/kg	NA		**45.6**		NA		**9,290**		NA		**642**	J	NA		NA	
HSS-A-0-101-09-088	02/10/06	02/10/06	Surface	REG	mg/kg	1	J	**11.3**		2.5		2,080		19,900		310		1.5		44.2	
HSS-A-0-101-09-104	02/08/06	11/27/06	Surface	REG	mg/kg	NA		**39.8**	J-	NA		**11,300**	J-	NA		**661**	J-	NA		NA	
HSS-A-0-101-09-106	02/08/06	02/10/06	Surface	REG	mg/kg	2	J	**32.8**		7.6		**11,900**		**30,400**		**658**		9		51.7	
HSS-A-0-101-09-107	02/08/06	02/10/06	Surface	REG	mg/kg	1.7	J	**31.1**		4.6		**13,100**		**36,300**		228		5.6		52.7	
HSS-A-0-101-09-107	02/08/06	11/20/06	Surface	REG	mg/kg	NA		**41.1**	J-	NA		**12,400**	J-	NA		305	J-	NA		NA	
HSS-A-0-101-09-108	02/08/06	11/20/06	Surface	REG	mg/kg	NA		**33.1**		NA		**16,200**		NA		133		NA		NA	
HSS-A-0-101-09-109	02/09/06	02/10/06	Surface	REG	mg/kg	1.8	J	**18.5**		4.6		**14,000**		**37,000**		185		6.8		52.2	
HSS-A-0-101-09-111B	02/09/06	11/20/06	Surface	REG	mg/kg	NA		**49.8**	J-	NA		**10,500**	J-	NA		193	J-	NA		NA	
HSS-A-0-101-09-111B	02/09/06	11/20/06	Surface	FD	mg/kg	NA		**45.7**	J-	NA		**9,640**	J-	NA		184	J-	NA		NA	
HSS-A-0-101-09-115	02/09/06	11/20/06	Surface	REG	mg/kg	NA		**24.1**	J-	NA		**5,170**	J-	NA		181	J-	NA		NA	
HSS-A-0-101-09-120	02/09/06	11/20/06	Surface	REG	mg/kg	NA		**40.8**	J-	NA		**7,590**	J-	NA		194	J-	NA		NA	
HSS-A-0-101-09-120	02/09/06	11/20/06	Surface	FD	mg/kg	NA		**21.2**	J-	NA		**4,800**	J-	NA		132	J-	NA		NA	

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Arizona Residential Soil Remediation Level[1] (mg/kg):						**31**		**10**		**39**		**3,100**		**--**		**400**		**390**		**78**	
EPA Region IX Preliminary Remediation Goal[2] (mg/kg):						**31**		**0.39**		**37**		**3,100**		**23,000**		**400**		**390**		**78**	
Location/	**Sample**	**Shipment**		**Sample**		**Antimony**		**Arsenic**		**Cadmium**		**Copper**		**Iron**		**Lead**		**Silver**		**Vanadium**	
Parcel ID	**Date**	**Date**	**Depth**	**Type**	**Units**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**
HSS-A-0-101-09-134	02/10/06	08/21/07	Surface	REG	mg/kg	NA		**7.7**	J-	NA		2,230	J-	NA		48.7	J-	NA		NA	
HSS-A-0-101-09-134	02/10/06	08/21/07	Surface	FD	mg/kg	NA		**10.6**	J-	NA		2,320	J-	NA		51.3	J-	NA		NA	
HSS-A-0-101-09-137	02/08/06	08/22/07	Surface	REG	mg/kg	NA		**23.1**	J	NA		**4,530**		NA		80.6	J	NA		NA	
HSS-A-0-101-09-137	02/08/06	08/22/07	Surface	FD	mg/kg	NA		**24.5**	J	NA		**3,560**		NA		72.2	J	NA		NA	
HSS-A-0-101-09-140	02/08/06	08/22/07	Surface	REG	mg/kg	NA		**30.7**	J	NA		**7,150**		NA		171	J	NA		NA	
HSS-A-0-101-09-140	02/08/06	08/22/07	Surface	FD	mg/kg	NA		**39.5**	J-	NA		**7,530**	J-	NA		187	J-	NA		NA	
HSS-A-1-101-07-018	02/06/06	11/27/06	Subsurface	REG	mg/kg	NA		**13**	J-	NA		2,940	J-	NA		223	J-	NA		NA	
HSS-A-1-101-07-035AE	02/09/06	08/21/07	Subsurface	REG	mg/kg	NA		**19.3**	J-	NA		**4,130**	J-	NA		83.8	J-	NA		NA	
HSS-A-1-101-07-061	02/02/06	08/21/07	Subsurface	REG	mg/kg	NA		**3.3**	J-	NA		509	J-	NA		8.4	J-	NA		NA	
HSS-A-1-101-07-062	02/02/06	11/27/06	Subsurface	REG	mg/kg	NA		**11.6**		NA		1,320		NA		47.5	J	NA		NA	
HSS-A-1-101-07-104	02/01/06	08/21/07	Subsurface	REG	mg/kg	NA		**22.7**	J-	NA		**4,930**	J-	NA		81.8	J-	NA		NA	
HSS-A-1-101-09-027	02/07/06	08/21/07	Subsurface	REG	mg/kg	NA		**11.3**	J-	NA		1,620	J-	NA		381	J-	NA		NA	
HSS-A-1-101-09-070	02/07/06	11/20/06	Subsurface	REG	mg/kg	NA		**13.1**	J-	NA		**3,550**	J-	NA		**433**	J-	NA		NA	
HSS-A-1-101-09-077	02/08/06	11/20/06	Subsurface	REG	mg/kg	NA		**11.1**	J-	NA		**3,520**	J-	NA		31.3	J-	NA		NA	
HSS-A-1-101-09-109	02/09/06	11/20/06	Subsurface	REG	mg/kg	NA		**10.7**	J-	NA		2,830	J-	NA		149	J-	NA		NA	
HSS-A-1-101-09-109	02/09/06	11/20/06	Subsurface	FD	mg/kg	NA		**11.3**	J-	NA		2,940	J-	NA		158	J-	NA		NA	
HSS-A-1-101-09-111B	02/09/06	11/20/06	Subsurface	REG	mg/kg	NA		**16.2**	J-	NA		**3,400**	J-	NA		66.7	J-	NA		NA	
HSS-A-1-101-09-120	02/09/06	11/20/06	Subsurface	REG	mg/kg	NA		**16.3**	J-	NA		**3,600**	J-	NA		73.4	J-	NA		NA	
HSS-B-0-101-07-008	02/09/06	11/20/06	Surface	REG	mg/kg	NA		**35.3**	J-	NA		**6,440**	J-	NA		266	J-	NA		NA	
HSS-B-0-101-07-008	02/09/06	11/20/06	Surface	FD	mg/kg	NA		**46.6**	J-	NA		**8,800**	J-	NA		**422**	J-	NA		NA	
HSS-B-0-101-07-010	02/09/06	11/20/06	Surface	REG	mg/kg	NA		**21.2**	J-	NA		**7,690**	J-	NA		**450**	J-	NA		NA	
HSS-B-0-101-07-014	02/03/06	11/27/06	Surface	REG	mg/kg	NA		**16.3**	J-	NA		**5,070**	J-	NA		247	J-	NA		NA	
HSS-B-0-101-07-018	02/06/06	11/27/06	Surface	REG	mg/kg	NA		**31.5**	J-	NA		**6,410**	J-	NA		**1,290**	J-	NA		NA	
HSS-B-0-101-07-027	02/06/06	08/21/07	Surface	REG	mg/kg	NA		**24.0**	J-	NA		**5,440**	J-	NA		143	J-	NA		NA	
HSS-B-0-101-07-028	02/06/06	11/20/06	Surface	REG	mg/kg	NA		**25.1**	J-	NA		**6,250**	J-	NA		163	J-	NA		NA	
HSS-B-0-101-07-029	02/06/06	02/08/06	Surface	REG	mg/kg	2.3	J	**36.5**		7.5		**9,610**		**24,000**		219		7.7		42.7	
HSS-B-0-101-07-029	02/06/06	11/20/06	Surface	REG	mg/kg	NA		**46.1**	J-	NA		**10,800**	J-	NA		249	J-	NA		NA	
HSS-B-0-101-07-030	02/06/06	11/20/06	Surface	REG	mg/kg	NA		**36.1**	J-	NA		**13,200**	J-	NA		259	J-	NA		NA	
HSS-B-0-101-07-034	02/09/06	11/20/06	Surface	REG	mg/kg	NA		**26.9**	J-	NA		**5,970**	J-	NA		163	J-	NA		NA	
HSS-B-0-101-07-035AE	02/09/06	08/21/07	Surface	REG	mg/kg	NA		**72.1**	J-	NA		**17,500**	J-	NA		276	J-	NA		NA	
HSS-B-0-101-07-035AN	02/09/06	11/20/06	Surface	REG	mg/kg	NA		**13.3**		NA		**7,640**		NA		78.4	J	NA		NA	
HSS-B-0-101-07-035AN	02/09/06	11/20/06	Surface	FD	mg/kg	NA		**12.8**		NA		**7,510**		NA		68.1	J	NA		NA	
HSS-B-0-101-07-035AS	02/09/06	02/10/06	Surface	REG	mg/kg	4.8	J	**1.6**		2.6		**19,000**		**84,400**		39.8		4.3		34.7	
HSS-B-0-101-07-035AS	02/09/06	11/20/06	Surface	REG	mg/kg	NA		**23**	J-	NA		**16,100**	J-	NA		46.4	J-	NA		NA	
HSS-B-0-101-07-037	02/03/06	11/20/06	Surface	REG	mg/kg	NA		**24.9**	J-	NA		**8,790**	J-	NA		**485**	J-	NA		NA	
HSS-B-0-101-07-040	02/03/06	02/03/06	Surface	REG	mg/kg	1.2	J	**11**		4.1		**5,270**		21,200		145		2.1		39.3	

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Arizona Residential Soil Remediation Level[1] (mg/kg):						**31**		**10**		**39**		**3,100**		**--**		**400**		**390**		**78**	
EPA Region IX Preliminary Remediation Goal[2] (mg/kg):						**31**		**0.39**		**37**		**3,100**		**23,000**		**400**		**390**		**78**	
Location/	**Sample**	**Shipment**		**Sample**		**Antimony**		**Arsenic**		**Cadmium**		**Copper**		**Iron**		**Lead**		**Silver**		**Vanadium**	
Parcel ID	**Date**	**Date**	**Depth**	**Type**	**Units**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**
HSS-B-0-101-07-041	02/03/06	08/21/07	Surface	REG	mg/kg	NA		**9.6**	J-	NA		2,530	J-	NA		124	J-	NA		NA	
HSS-B-0-101-07-042	02/03/06	08/21/07	Surface	REG	mg/kg	NA		**5.3**	J-	NA		1,630	J-	NA		75.6	J-	NA		NA	
HSS-B-0-101-07-046	02/06/06	08/21/07	Surface	REG	mg/kg	NA		**12.4**	J-	NA		**4,640**	J-	NA		**451**	J-	NA		NA	
HSS-B-0-101-07-047	02/06/06	11/27/06	Surface	REG	mg/kg	NA		**12.4**	J-	NA		**4,600**	J-	NA		152	J-	NA		NA	
HSS-B-0-101-07-050A	02/03/06	08/21/07	Surface	REG	mg/kg	NA		**8.2**	J-	NA		**3,230**	J-	NA		76.0	J-	NA		NA	
HSS-B-0-101-07-052	02/02/06	11/20/06	Surface	REG	mg/kg	NA		**36.9**	J-	NA		**10,600**	J-	NA		249	J-	NA		NA	
HSS-B-0-101-07-060	02/02/06	08/21/07	Surface	REG	mg/kg	NA		**31.9**	J-	NA		**8,000**	J-	NA		221	J-	NA		NA	
HSS-B-0-101-07-061	02/02/06	08/21/07	Surface	REG	mg/kg	NA		**6.9**	J-	NA		**3,250**	J-	NA		47.2	J-	NA		NA	
HSS-B-0-101-07-062	02/06/06	11/27/06	Surface	REG	mg/kg	NA		**10.6**		NA		2,930		NA		76.4	J	NA		NA	
HSS-B-0-101-07-062	02/06/06	11/27/06	Surface	FD	mg/kg	NA		**10.9**		NA		2,780		NA		104	J	NA		NA	
HSS-B-0-101-07-065	02/06/06	08/22/07	Surface	REG	mg/kg	NA		**12.0**	J-	NA		1,530	J-	NA		217	J-	NA		NA	
HSS-B-0-101-07-066	02/06/06	08/21/07	Surface	REG	mg/kg	NA		**15.5**	J-	NA		**4,740**	J-	NA		130	J-	NA		NA	
HSS-B-0-101-07-082	02/06/06	02/08/06	Surface	REG	mg/kg	0.72	J	**8.9**		1.5		1,710		18,100		79.9		1.1		44.4	
HSS-B-0-101-07-089K	02/09/06	11/20/06	Surface	REG	mg/kg	NA		**33**	J-	NA		**6,140**	J-	NA		82.2	J-	NA		NA	
HSS-B-0-101-07-089Q	02/02/06	08/22/07	Surface	REG	mg/kg	NA		**13.1**	J-	NA		**5,360**	J-	NA		35.6	J-	NA		NA	
HSS-B-0-101-07-089S	02/07/06	11/20/06	Surface	REG	mg/kg	NA		**40.1**	J-	NA		**16,100**	J-	NA		176	J-	NA		NA	
HSS-B-0-101-07-089T	02/07/06	02/08/06	Surface	REG	mg/kg	4.5	J	**57.3**		10.9		**23,300**		**32,100**		264		19.3		56.6	
HSS-B-0-101-07-089U	02/07/06	11/20/06	Surface	REG	mg/kg	NA		**38.9**	J-	NA		**11,200**	J-	NA		103	J-	NA		NA	
HSS-B-0-101-07-089U	02/07/06	11/20/06	Surface	FD	mg/kg	NA		**39.1**	J-	NA		**11,200**	J-	NA		104	J-	NA		NA	
HSS-B-0-101-07-090	02/02/06	08/21/07	Surface	REG	mg/kg	NA		**15.5**	J-	NA		**6,770**	J-	NA		108	J-	NA		NA	
HSS-B-0-101-07-091	02/02/06	11/20/06	Surface	REG	mg/kg	NA		**3.1**	J-	NA		1,820	J-	NA		24.7	J-	NA		NA	
HSS-B-0-101-07-091	02/02/06	11/20/06	Surface	FD	mg/kg	NA		**2.7**	J-	NA		1,560	J-	NA		22.1	J-	NA		NA	
HSS-B-0-101-07-092A	02/02/06	08/21/07	Surface	REG	mg/kg	NA		**10.7**	J-	NA		**4,690**	J-	NA		45.4	J-	NA		NA	
HSS-B-0-101-07-099	02/01/06	11/20/06	Surface	REG	mg/kg	NA		**38.9**	J-	NA		**11,400**	J-	NA		**455**	J-	NA		NA	
HSS-B-0-101-07-104	02/01/06	08/21/07	Surface	REG	mg/kg	NA		**10.3**	J-	NA		**3,940**	J-	NA		**630**	J-	NA		NA	
HSS-B-0-101-07-105	02/02/06	11/20/06	Surface	REG	mg/kg	NA		**44.4**	J-	NA		**7,970**	J-	NA		**609**	J-	NA		NA	
HSS-B-0-101-07-110	02/02/06	02/03/06	Surface	REG	mg/kg	0.47	J	**3.3**		0.52		1,590		14,000		16.5		1.3		28.7	
HSS-B-0-101-07-111	02/01/06	08/21/07	Surface	REG	mg/kg	NA		***3.0***	UJ	NA		30.3	J-	NA		97.4	J-	NA		NA	
HSS-B-0-101-07-111	02/01/06	08/28/07	Surface	FD	mg/kg	NA		**21.3**	J-	NA		**7,730**	J-	NA		110	J-	NA		NA	
HSS-B-0-101-07-117	02/01/06	11/27/06	Surface	REG	mg/kg	NA		**41.2**	J-	NA		**13,800**	J-	NA		389	J-	NA		NA	
HSS-B-0-101-07-129	02/01/06	08/21/07	Surface	REG	mg/kg	NA		**33.7**	J	NA		**9,620**		NA		348		NA		NA	
HSS-B-0-101-07-142A	01/31/06	08/21/07	Surface	REG	mg/kg	NA		**0.51**	J	NA		307		NA		23.5		NA		NA	
HSS-B-0-101-07-149	01/31/06	08/22/07	Surface	REG	mg/kg	NA		**33.6**	J-	NA		**10,300**	J-	NA		**424**	J-	NA		NA	
HSS-B-0-101-07-176	01/31/06	11/20/06	Surface	REG	mg/kg	NA		**9.1**	J-	NA		1,470	J-	NA		61.8	J-	NA		NA	
HSS-B-0-101-07-185C	01/31/06	08/22/07	Surface	REG	mg/kg	NA		**5.2**	J-	NA		1,030	J-	NA		32.9	J-	NA		NA	
HSS-B-0-101-07-185C	01/31/06	08/28/07	Surface	FD	mg/kg	NA		**7.1**	J-	NA		1,230	J-	NA		38.9	J-	NA		NA	

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ASARCO LLC Hayden, Arizona Plant Site

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Arizona Residential Soil Remediation Level[1] (mg/kg):						**31**		**10**		**39**		**3,100**		**--**		**400**		**390**		**78**	
EPA Region IX Preliminary Remediation Goal[2] (mg/kg):						**31**		**0.39**		**37**		**3,100**		**23,000**		**400**		**390**		**78**	
Location/	**Sample**	**Shipment**		**Sample**		**Antimony**		**Arsenic**		**Cadmium**		**Copper**		**Iron**		**Lead**		**Silver**		**Vanadium**	
Parcel ID	**Date**	**Date**	**Depth**	**Type**	**Units**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**
HSS-B-0-101-07-193A	01/31/06	02/02/06	Surface	REG	mg/kg	1.1	J	**9.4**		2.1		1,860		**25,300**		73.4		1.8		54.2	
HSS-B-0-101-07-202	01/31/06	08/21/07	Surface	REG	mg/kg	NA		***0.68***	U	NA		186	J-	NA		13.1	J-	NA		NA	
HSS-B-0-101-07-216	01/30/06	08/21/07	Surface	REG	mg/kg	NA		**8.1**	J-	NA		1,400	J-	NA		91.9	J-	NA		NA	
HSS-B-0-101-07-216	01/30/06	08/21/07	Surface	FD	mg/kg	NA		**6.8**	J-	NA		1,160	J-	NA		68.0	J-	NA		NA	
HSS-B-0-101-07-219	01/31/06	02/02/06	Surface	REG	mg/kg	1	J	**6.9**		1.4		2,170		14,100		60		1.9		29.2	
HSS-B-0-101-07-234	02/01/06	08/21/07	Surface	REG	mg/kg	NA		**8.7**	J-	NA		1,800	J-	NA		58.0	J-	NA		NA	
HSS-B-0-101-07-236	02/01/06	02/03/06	Surface	REG	mg/kg	0.78	J	**7.9**		1.7		1,090		14,700		60.8		0.44	J	28	
HSS-B-0-101-07-242	01/31/06	08/21/07	Surface	REG	mg/kg	NA		**12.6**	J-	NA		**4,470**	J-	NA		122	J-	NA		NA	
HSS-B-0-101-07-242	01/31/06	08/21/07	Surface	FD	mg/kg	NA		**10.5**	J-	NA		**3,510**	J-	NA		101	J-	NA		NA	
HSS-B-0-101-07-244	02/01/06	08/21/07	Surface	REG	mg/kg	NA		**14.4**	J-	NA		**3,200**	J-	NA		196	J-	NA		NA	
HSS-B-0-101-07-244	02/01/06	08/21/07	Surface	FD	mg/kg	NA		**14.4**	J-	NA		**3,290**	J-	NA		185	J-	NA		NA	
HSS-B-0-101-07-247	01/31/06	08/21/07	Surface	REG	mg/kg	NA		**2.7**	J-	NA		798	J-	NA		41.6	J-	NA		NA	
HSS-B-0-101-07-251	01/31/06	08/21/07	Surface	REG	mg/kg	NA		**10.8**	J-	NA		**3,320**	J-	NA		119	J-	NA		NA	
HSS-B-0-101-07-259	01/31/06	08/21/07	Surface	REG	mg/kg	NA		**15.6**	J-	NA		**3,340**	J-	NA		92.6	J-	NA		NA	
HSS-B-0-101-07-270	02/01/06	02/03/06	Surface	REG	mg/kg	3.3	J	**38.4**		10.3		**12,200**		**34,800**		219		7.4		55.9	
HSS-B-0-101-07-270	02/01/06	11/27/06	Surface	REG	mg/kg	NA		**67.7**	J-	NA		**15,500**	J-	NA		315	J-	NA		NA	
HSS-B-0-101-07-284	02/01/06	08/21/07	Surface	REG	mg/kg	NA		**17.9**	J-	NA		**6,340**	J-	NA		143	J-	NA		NA	
HSS-B-0-101-07-286	02/01/06	08/21/07	Surface	REG	mg/kg	NA		**14.0**	J-	NA		1,460	J-	NA		33.5	J-	NA		NA	
HSS-B-0-101-07-301	02/01/06	08/21/07	Surface	REG	mg/kg	NA		**24.6**	J-	NA		**12,000**	J-	NA		118	J-	NA		NA	
HSS-B-0-101-07-303	02/01/06	08/21/07	Surface	REG	mg/kg	NA		**14.2**	J-	NA		**17,200**	J-	NA		47.0	J-	NA		NA	
HSS-B-0-101-07-304A	02/01/06	08/21/07	Surface	REG	mg/kg	NA		**13.1**	J-	NA		2,870	J-	NA		103	J-	NA		NA	
HSS-B-0-101-09-004	02/07/06	11/20/06	Surface	REG	mg/kg	NA		**12.4**	J-	NA		2,110	J-	NA		69.3	J-	NA		NA	
HSS-B-0-101-09-008	02/07/06	11/20/06	Surface	REG	mg/kg	NA		**31.8**	J-	NA		**4,390**	J-	NA		181	J-	NA		NA	
HSS-B-0-101-09-010	02/07/06	02/08/06	Surface	REG	mg/kg	1.5	J	**11.6**		2		3,040		17,600		140		2.2		35.2	
HSS-B-0-101-09-010	02/07/06	02/08/06	Surface	FD	mg/kg	0.94	J	**12.5**		2.1		3,040		17,000		143		2.3		31.4	
HSS-B-0-101-09-010	02/07/06	11/20/06	Surface	REG	mg/kg	NA		**13.8**	J-	NA		**3,340**	J-	NA		**1,140**	J-	NA		NA	
HSS-B-0-101-09-010	02/07/06	09/14/07	Surface	REG	mg/kg	NA		**12.2**	J-	NA		2,330	J-	NA		**611**	J-	NA		NA	
HSS-B-0-101-09-014	02/06/06	08/21/07	Surface	REG	mg/kg	NA		**16.1**	J-	NA		**5,260**	J-	NA		224	J-	NA		NA	
HSS-B-0-101-09-014	02/06/06	08/21/07	Surface	FD	mg/kg	NA		**15.8**	J-	NA		**5,360**	J-	NA		260	J-	NA		NA	
HSS-B-0-101-09-025A	02/07/06	08/21/07	Surface	REG	mg/kg	NA		**15.7**	J-	NA		**6,240**	J-	NA		189	J-	NA		NA	
HSS-B-0-101-09-025A	02/07/06	08/21/07	Surface	FD	mg/kg	NA		**14.2**	J-	NA		**4,430**	J-	NA		132	J-	NA		NA	
HSS-B-0-101-09-027	02/07/06	08/21/07	Surface	REG	mg/kg	NA		**9.5**	J-	NA		1,680	J-	NA		399	J-	NA		NA	
HSS-B-0-101-09-032	02/01/06	11/27/06	Surface	REG	mg/kg	NA		**32.3**	J-	NA		**8,160**	J-	NA		359	J-	NA		NA	
HSS-B-0-101-09-032	02/07/06	11/27/06	Surface	FD	mg/kg	NA		**40.1**	J-	NA		**9,940**	J-	NA		389	J-	NA		NA	
HSS-B-0-101-09-033	02/06/06	02/08/06	Surface	REG	mg/kg	2.5	J	**33.4**		9.5		**9,650**		**29,700**		**980**		6.8		41.5	
HSS-B-0-101-09-036	02/09/06	11/20/06	Surface	REG	mg/kg	NA		**16**	J-	NA		2,780	J-	NA		**700**	J-	NA		NA	

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Arizona Residential Soil Remediation Level[1] (mg/kg):						**31**		**10**		**39**		**3,100**		**--**		**400**		**390**		**78**	
EPA Region IX Preliminary Remediation Goal[2] (mg/kg):						**31**		**0.39**		**37**		**3,100**		**23,000**		**400**		**390**		**78**	
Location/	**Sample**	**Shipment**		**Sample**		**Antimony**		**Arsenic**		**Cadmium**		**Copper**		**Iron**		**Lead**		**Silver**		**Vanadium**	
Parcel ID	**Date**	**Date**	**Depth**	**Type**	**Units**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**
HSS-B-0-101-09-038	02/09/06	11/20/06	Surface	REG	mg/kg	NA		**68.2**	J-	NA		**16,400**	J-	NA		**408**	J-	NA		NA	
HSS-B-0-101-09-039	02/10/06	08/21/07	Surface	REG	mg/kg	NA		**20.0**	J-	NA		**5,380**	J-	NA		270	J-	NA		NA	
HSS-B-0-101-09-042	02/09/06	08/21/07	Surface	REG	mg/kg	NA		**26.0**	J-	NA		**7,110**	J-	NA		304	J-	NA		NA	
HSS-B-0-101-09-045	02/10/06	08/21/07	Surface	REG	mg/kg	NA		**15.2**	J-	NA		**4,430**	J-	NA		116	J-	NA		NA	
HSS-B-0-101-09-047	02/09/06	08/21/07	Surface	REG	mg/kg	NA		**19.9**	J-	NA		**6,340**	J-	NA		**629**	J-	NA		NA	
HSS-B-0-101-09-054	02/10/06	08/21/07	Surface	REG	mg/kg	NA		**18.1**	J-	NA		**3,250**	J-	NA		**617**	J-	NA		NA	
HSS-B-0-101-09-059	02/07/06	02/08/06	Surface	REG	mg/kg	0.81	J	**3.8**		0.61		1,090		8,530		22.3		0.84	J	16.3	
HSS-B-0-101-09-062	02/08/06	08/21/07	Surface	REG	mg/kg	NA		**4.6**	J-	NA		1,410	J-	NA		122	J-	NA		NA	
HSS-B-0-101-09-064	02/08/06	11/20/06	Surface	REG	mg/kg	NA		**15.2**		NA		**4,980**		NA		127		NA		NA	
HSS-B-0-101-09-067	02/08/06	02/10/06	Surface	REG	mg/kg	0.96	J	**16.7**		3.1		**3,550**		18,900		307		2.8		39.7	
HSS-B-0-101-09-067	02/08/06	11/20/06	Surface	REG	mg/kg	NA		**20.7**	J-	NA		**4,700**	J-	NA		**718**	J-	NA		NA	
HSS-B-0-101-09-067	02/08/06	09/14/07	Surface	REG	mg/kg	NA		**20.7**	J-	NA		**3,690**	J-	NA		347	J-	NA		NA	
HSS-B-0-101-09-068	02/08/06	08/21/07	Surface	REG	mg/kg	NA		**12.0**	J-	NA		**3,260**	J-	NA		161	J-	NA		NA	
HSS-B-0-101-09-068	02/08/06	08/21/07	Surface	FD	mg/kg	NA		**13.0**	J-	NA		**3,370**	J-	NA		66.8	J-	NA		NA	
HSS-B-0-101-09-070	02/07/06	11/20/06	Surface	REG	mg/kg	NA		**32.7**	J-	NA		**9,260**	J-	NA		**514**	J-	NA		NA	
HSS-B-0-101-09-072	02/07/06	08/21/07	Surface	REG	mg/kg	NA		**23.8**	J-	NA		**5,890**	J-	NA		281	J-	NA		NA	
HSS-B-0-101-09-077	02/08/06	11/20/06	Surface	REG	mg/kg	NA		**23.4**	J-	NA		**4,130**	J-	NA		211	J-	NA		NA	
HSS-B-0-101-09-083	02/10/06	08/21/07	Surface	REG	mg/kg	NA		**1.7**	J-	NA		254	J-	NA		28.2	J-	NA		NA	
HSS-B-0-101-09-084	02/10/06	02/10/06	Surface	REG	mg/kg	1.3	J	**10.5**		2.4		2,610		20,500		260		2.5		44.5	
HSS-B-0-101-09-088	02/10/06	02/10/06	Surface	REG	mg/kg	**126**	J	**21.8**		2.2		1,950		14,100		**92,600**		2.3		30.6	
HSS-B-0-101-09-088	02/10/06	11/28/06	Surface	REG	mg/kg	NA		**32.3**	J-	NA		2,150	J-	NA		**87,200**	J-	NA		NA	
HSS-B-0-101-09-104	02/08/06	11/20/06	Surface	REG	mg/kg	NA		**28.9**	J-	NA		**5,960**	J-	NA		**445**	J-	NA		NA	
HSS-B-0-101-09-106	02/08/06	11/20/06	Surface	REG	mg/kg	NA		**24.5**	J-	NA		**8,240**	J-	NA		273	J-	NA		NA	
HSS-B-0-101-09-107	02/08/06	11/20/06	Surface	REG	mg/kg	NA		**24.3**	J-	NA		**5,350**	J-	NA		**487**	J-	NA		NA	
HSS-B-0-101-09-108	02/08/06	02/10/06	Surface	REG	mg/kg	1.5	J	**26.4**		6		**9,050**		**31,900**		**766**		4		47.2	
HSS-B-0-101-09-108	02/08/06	11/20/06	Surface	REG	mg/kg	NA		**40.2**		NA		**10,300**		NA		**487**		NA		NA	
HSS-B-0-101-09-109	02/09/06	11/20/06	Surface	REG	mg/kg	NA		**26.9**	J-	NA		**9,320**	J-	NA		376	J-	NA		NA	
HSS-B-0-101-09-111B	02/09/06	02/10/06	Surface	REG	mg/kg	1.2	J	**33**		6.4		**9,150**		**26,400**		156		8		66.4	
HSS-B-0-101-09-115	02/09/06	11/20/06	Surface	REG	mg/kg	NA		**17.3**	J-	NA		**3,690**	J-	NA		175	J-	NA		NA	
HSS-B-0-101-09-115	02/10/06	11/20/06	Surface	FD	mg/kg	NA		**20.3**	J-	NA		**4,600**	J-	NA		170	J-	NA		NA	
HSS-B-0-101-09-120	02/09/06	11/20/06	Surface	REG	mg/kg	NA		**15.5**	J-	NA		2,750	J-	NA		77.2	J-	NA		NA	
HSS-B-0-101-09-134	02/10/06	08/21/07	Surface	REG	mg/kg	NA		**2.7**	J-	NA		653	J-	NA		18.1	J-	NA		NA	
HSS-B-0-101-09-137	02/08/06	08/22/07	Surface	REG	mg/kg	NA		**24.7**	J	NA		1,710		NA		48.3	J	NA		NA	
HSS-B-0-101-09-140	02/08/06	08/22/07	Surface	REG	mg/kg	NA		**7.1**	J	NA		1,850		NA		30.4	J	NA		NA	
HSS-B-1-101-07-028	02/06/06	11/20/06	Subsurface	REG	mg/kg	NA		**13.7**	J-	NA		2,030	J-	NA		84.6	J-	NA		NA	
HSS-B-1-101-07-035AN	02/09/06	11/20/06	Subsurface	REG	mg/kg	NA		**10.3**	J-	NA		**8,580**	J-	NA		61.3	J-	NA		NA	

TABLE 4-9
Soil Sampling Laboratory Value Exceedances for Full Inorganic Target Analyte List
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The data in this table are illustrated on figures 4-5, 4-13, 4-15, 4-17, 4-63, 4-64, 4-65, 4-66, 4-67, 4-68, and 4-69.

Arizona Residential Soil Remediation Level[1] (mg/kg):						**31**		**10**		**39**		**3,100**		**--**		**400**		**390**		**78**	
EPA Region IX Preliminary Remediation Goal[2] (mg/kg):						**31**		**0.39**		**37**		**3,100**		**23,000**		**400**		**390**		**78**	
Location/	**Sample**	**Shipment**		**Sample**		**Antimony**		**Arsenic**		**Cadmium**		**Copper**		**Iron**		**Lead**		**Silver**		**Vanadium**	
Parcel ID	**Date**	**Date**	**Depth**	**Type**	**Units**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**
HSS-B-1-101-07-046	02/06/06	08/21/07	Subsurface	REG	mg/kg	NA		**6.5**	J-	NA		512	J-	NA		57.9	J-	NA		NA	
HSS-B-1-101-07-060	02/02/06	08/21/07	Subsurface	REG	mg/kg	NA		**10.3**	J-	NA		826	J-	NA		32.6	J-	NA		NA	
HSS-B-1-101-07-082	02/06/06	08/21/07	Subsurface	REG	mg/kg	NA		**12.2**	J-	NA		1,420	J-	NA		100	J-	NA		NA	
HSS-B-1-101-07-089T	02/07/06	11/27/06	Subsurface	REG	mg/kg	NA		**31.7**	J-	NA		**6,020**	J-	NA		94.2	J-	NA		NA	
HSS-B-1-101-07-129	02/01/06	08/21/07	Subsurface	REG	mg/kg	NA		**5.1**	J	NA		1,150		NA		94.2		NA		NA	
HSS-B-1-101-07-284	02/01/06	08/21/07	Subsurface	REG	mg/kg	NA		**13.1**	J-	NA		788	J-	NA		27.5	J-	NA		NA	
HSS-B-1-101-07-303	02/01/06	08/21/07	Subsurface	REG	mg/kg	NA		**22.2**	J-	NA		**4,260**	J-	NA		28.5	J-	NA		NA	
HSS-B-1-101-09-032	02/07/06	11/27/06	Subsurface	REG	mg/kg	NA		**15.9**	J-	NA		1,550	J-	NA		112	J-	NA		NA	
HSS-B-1-101-09-047	02/09/06	08/21/07	Subsurface	REG	mg/kg	NA		**6.7**	J-	NA		1,720	J-	NA		149	J-	NA		NA	
HSS-B-1-101-09-054	02/10/06	08/21/07	Subsurface	REG	mg/kg	NA		**3.3**	J-	NA		720	J-	NA		226	J-	NA		NA	
HSS-B-1-101-09-059	02/07/06	08/21/07	Subsurface	REG	mg/kg	NA		**8.7**	J-	NA		2,310	J-	NA		269	J-	NA		NA	
HSS-B-1-101-09-084	02/10/06	11/20/06	Subsurface	REG	mg/kg	NA		**8.5**		NA		707		NA		152	J	NA		NA	
HSS-B-1-101-09-104	02/08/06	11/28/06	Subsurface	REG	mg/kg	NA		**20.2**	J-	NA		3,050	J-	NA		232	J-	NA		NA	
HSS-C-0-101-07-008	02/09/06	11/20/06	Surface	REG	mg/kg	NA		**24**	J-	NA		**6,410**	J-	NA		140	J-	NA		NA	
HSS-C-0-101-07-010	02/09/06	11/20/06	Surface	REG	mg/kg	NA		**15**	J-	NA		**5,770**	J-	NA		52.6	J-	NA		NA	
HSS-C-0-101-07-014	02/03/06	11/27/06	Surface	REG	mg/kg	NA		**32.8**	J-	NA		**9,340**	J-	NA		**661**	J-	NA		NA	
HSS-C-0-101-07-018	02/06/06	11/27/06	Surface	REG	mg/kg	NA		**21.2**	J-	NA		**5,540**	J-	NA		235	J-	NA		NA	
HSS-C-0-101-07-027	02/06/06	08/21/07	Surface	REG	mg/kg	NA		**33.5**	J-	NA		**5,370**	J-	NA		214	J-	NA		NA	
HSS-C-0-101-07-028	02/06/06	02/08/06	Surface	REG	mg/kg	1.2	J	**20.5**		2.5		2,800		17,500		75.8		2.4		35.3	
HSS-C-0-101-07-028	02/06/06	11/20/06	Surface	REG	mg/kg	NA		**25.1**	J-	NA		**3,140**	J-	NA		86.9	J-	NA		NA	
HSS-C-0-101-07-029	02/06/06	11/20/06	Surface	REG	mg/kg	NA		**31**	J-	NA		2,880	J-	NA		74.1	J-	NA		NA	
HSS-C-0-101-07-030	02/06/06	11/20/06	Surface	REG	mg/kg	NA		**15.6**	J-	NA		**6,190**	J-	NA		94.5	J-	NA		NA	
HSS-C-0-101-07-034	02/09/06	02/10/06	Surface	REG	mg/kg	2.4	J	**24.8**		6.8		**11,600**		**28,500**		**444**		7		40.8	
HSS-C-0-101-07-035AE	02/09/06	08/21/07	Surface	REG	mg/kg	NA		**65.0**	J-	NA		**5,770**	J-	NA		144	J-	NA		NA	
HSS-C-0-101-07-035AN	02/09/06	11/20/06	Surface	REG	mg/kg	NA		**54.9**		NA		**31,100**		NA		128	J	NA		NA	
HSS-C-0-101-07-035AS	02/09/06	11/20/06	Surface	REG	mg/kg	NA		**27.4**	J-	NA		**17,400**	J-	NA		96.4	J-	NA		NA	
HSS-C-0-101-07-037	02/03/06	11/20/06	Surface	REG	mg/kg	NA		**39.6**	J-	NA		**14,000**	J-	NA		181	J-	NA		NA	
HSS-C-0-101-07-040	02/03/06	11/20/06	Surface	REG	mg/kg	NA		**28.5**	J-	NA		**17,300**	J-	NA		82.4	J-	NA		NA	
HSS-C-0-101-07-040	02/03/06	11/20/06	Surface	FD	mg/kg	NA		**29.8**	J-	NA		**18,100**	J-	NA		83.8	J-	NA		NA	
HSS-C-0-101-07-041	02/03/06	08/21/07	Surface	REG	mg/kg	NA		**12.9**	J-	NA		2,330	J-	NA		213	J-	NA		NA	
HSS-C-0-101-07-042	02/03/06	08/21/07	Surface	REG	mg/kg	NA		**22.6**	J-	NA		**4,020**	J-	NA		372	J-	NA		NA	
HSS-C-0-101-07-046	02/06/06	08/21/07	Surface	REG	mg/kg	NA		**3.2**	J-	NA		1,010	J-	NA		112	J-	NA		NA	
HSS-C-0-101-07-047	02/06/06	11/27/06	Surface	REG	mg/kg	NA		**17.9**		NA		**5,390**		NA		250	J	NA		NA	
HSS-C-0-101-07-050A	02/03/06	02/03/06	Surface	REG	mg/kg	1.2	J	**10**		2.5		**4,950**		21,400		72.2		4		45.5	
HSS-C-0-101-07-052	02/02/06	11/20/06	Surface	REG	mg/kg	NA		**13.8**	J-	NA		**4,220**	J-	NA		78.6	J-	NA		NA	
HSS-C-0-101-07-052	02/02/06	11/20/06	Surface	FD	mg/kg	NA		**13.5**	J-	NA		**4,200**	J-	NA		76.6	J-	NA		NA	

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Arizona Residential Soil Remediation Level[1] (mg/kg):						**31**		**10**		**39**		**3,100**		**--**		**400**		**390**		**78**	
EPA Region IX Preliminary Remediation Goal[2] (mg/kg):						**31**		**0.39**		**37**		**3,100**		**23,000**		**400**		**390**		**78**	
Location/	**Sample**	**Shipment**		**Sample**		**Antimony**		**Arsenic**		**Cadmium**		**Copper**		**Iron**		**Lead**		**Silver**		**Vanadium**	
Parcel ID	**Date**	**Date**	**Depth**	**Type**	**Units**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**
HSS-C-0-101-07-060	02/02/06	08/21/07	Surface	REG	mg/kg	NA		**23.9**	J-	NA		**8,120**	J-	NA		246	J-	NA		NA	
HSS-C-0-101-07-061	02/02/06	08/21/07	Surface	REG	mg/kg	NA		**14.4**	J-	NA		3,030	J-	NA		67.1	J-	NA		NA	
HSS-C-0-101-07-062	02/06/06	11/27/06	Surface	REG	mg/kg	NA		**21.4**		NA		**8,370**		NA		106	J	NA		NA	
HSS-C-0-101-07-065	02/06/06	08/22/07	Surface	REG	mg/kg	NA		**6.1**	J-	NA		1,300	J-	NA		143	J-	NA		NA	
HSS-C-0-101-07-082	02/06/06	08/21/07	Surface	REG	mg/kg	NA		**22.6**	J-	NA		**4,410**	J-	NA		301	J-	NA		NA	
HSS-C-0-101-07-089K	02/07/06	11/20/06	Surface	REG	mg/kg	NA		**40.6**	J-	NA		**8,320**	J-	NA		189	J-	NA		NA	
HSS-C-0-101-07-089K	02/07/06	11/20/06	Surface	FD	mg/kg	NA		**157**	J-	NA		**6,120**	J-	NA		342	J-	NA		NA	
HSS-C-0-101-07-089Q	02/02/06	08/22/07	Surface	REG	mg/kg	NA		**31.0**	J-	NA		**9,170**	J-	NA		116	J-	NA		NA	
HSS-C-0-101-07-089S	02/07/06	11/20/06	Surface	REG	mg/kg	NA		**69.8**	J-	NA		**24,200**	J-	NA		239	J-	NA		NA	
HSS-C-0-101-07-089T	02/07/06	11/27/06	Surface	REG	mg/kg	NA		**64.2**		NA		**19,000**		NA		176	J	NA		NA	
HSS-C-0-101-07-089U	02/07/06	11/20/06	Surface	REG	mg/kg	NA		**47.8**	J-	NA		**18,600**	J-	NA		133	J-	NA		NA	
HSS-C-0-101-07-090	02/02/06	11/20/06	Surface	REG	mg/kg	NA		**30.4**	J-	NA		**11,700**	J-	NA		163	J-	NA		NA	
HSS-C-0-101-07-091	02/02/06	11/20/06	Surface	REG	mg/kg	NA		**64.6**	J-	NA		**33,300**	J-	NA		189	J-	NA		NA	
HSS-C-0-101-07-092A	02/02/06	02/03/06	Surface	REG	mg/kg	1.3	J	**15.9**		2.9		**7,460**		21,800		85.5		4.5		38.2	
HSS-C-0-101-07-099	02/01/06	11/20/06	Surface	REG	mg/kg	NA		**54**	J-	NA		**15,500**	J-	NA		252	J-	NA		NA	
HSS-C-0-101-07-104	02/01/06	02/03/06	Surface	REG	mg/kg	3	J	**21**		7.3		**18,800**		**40,400**		195		12.1		64.9	
HSS-C-0-101-07-105	02/02/06	11/20/06	Surface	REG	mg/kg	NA		**21.1**	J-	NA		**31,600**	J-	NA		206	J-	NA		NA	
HSS-C-0-101-07-110	02/02/06	08/21/07	Surface	REG	mg/kg	NA		**11.2**	J-	NA		**4,390**	J-	NA		39.3	J-	NA		NA	
HSS-C-0-101-07-111	02/01/06	08/21/07	Surface	REG	mg/kg	NA		**7.6**	J-	NA		2,350	J-	NA		19.2	J-	NA		NA	
HSS-C-0-101-07-117	02/01/06	11/27/06	Surface	REG	mg/kg	NA		**23.1**	J-	NA		**6,740**	J-	NA		138	J-	NA		NA	
HSS-C-0-101-07-129	02/01/06	08/21/07	Surface	REG	mg/kg	NA		**28.4**	J	NA		**6,060**		NA		347		NA		NA	
HSS-C-0-101-07-142A	01/31/06	08/21/07	Surface	REG	mg/kg	NA		**0.98**	J	NA		408		NA		17.1		NA		NA	
HSS-C-0-101-07-149	01/31/06	08/22/07	Surface	REG	mg/kg	NA		**16.6**	J-	NA		**3,970**	J-	NA		176	J-	NA		NA	
HSS-C-0-101-07-176	01/31/06	11/20/06	Surface	REG	mg/kg	NA		**15.3**	J-	NA		2,560	J-	NA		83.9	J-	NA		NA	
HSS-C-0-101-07-185C	01/31/06	08/22/07	Surface	REG	mg/kg	NA		**7.6**	J-	NA		2,100	J-	NA		52.3	J-	NA		NA	
HSS-C-0-101-07-193A	01/31/06	08/22/07	Surface	REG	mg/kg	NA		**16.8**	J-	NA		2,430	J-	NA		126	J-	NA		NA	
HSS-C-0-101-07-202	01/31/06	08/21/07	Surface	REG	mg/kg	NA		**15.3**	J-	NA		3,040	J-	NA		101	J-	NA		NA	
HSS-C-0-101-07-216	01/30/06	08/21/07	Surface	REG	mg/kg	NA		**12.0**	J-	NA		411	J-	NA		57.1	J-	NA		NA	
HSS-C-0-101-07-219	01/31/06	08/21/07	Surface	REG	mg/kg	NA		**14.9**	J-	NA		1,770	J-	NA		82.3	J-	NA		NA	
HSS-C-0-101-07-234	02/01/06	02/03/06	Surface	REG	mg/kg	1.2	J	**6.9**		1.5		1,820		19,600		83.1		1.2		46.4	
HSS-C-0-101-07-236	02/01/06	08/21/07	Surface	REG	mg/kg	NA		**19.3**	J-	NA		**3,990**	J-	NA		190	J-	NA		NA	
HSS-C-0-101-07-242	01/31/06	08/21/07	Surface	REG	mg/kg	NA		**12.6**	J-	NA		2,940	J-	NA		120	J-	NA		NA	
HSS-C-0-101-07-244	02/01/06	08/21/07	Surface	REG	mg/kg	NA		**9.9**	J-	NA		2,630	J-	NA		112	J-	NA		NA	
HSS-C-0-101-07-247	01/31/06	08/21/07	Surface	REG	mg/kg	NA		**12.5**	J-	NA		**3,200**	J-	NA		266	J-	NA		NA	
HSS-C-0-101-07-251	01/31/06	02/02/06	Surface	REG	mg/kg	1.3	J	**9.3**		3.5		**3,320**		19,800		113		2.3		32.3	
HSS-C-0-101-07-259	01/31/06	08/21/07	Surface	REG	mg/kg	NA		**9.9**	J-	NA		2,590	J-	NA		80.6	J-	NA		NA	

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Arizona Residential Soil Remediation Level[1] (mg/kg):						**31**		**10**		**39**		**3,100**		**--**		**400**		**390**		**78**	
EPA Region IX Preliminary Remediation Goal[2] (mg/kg):						**31**		**0.39**		**37**		**3,100**		**23,000**		**400**		**390**		**78**	
Location/	**Sample**	**Shipment**		**Sample**		**Antimony**		**Arsenic**		**Cadmium**		**Copper**		**Iron**		**Lead**		**Silver**		**Vanadium**	
Parcel ID	**Date**	**Date**	**Depth**	**Type**	**Units**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**
HSS-C-0-101-07-270	02/01/06	11/27/06	Surface	REG	mg/kg	NA		**9**	J-	NA		**3,940**	J-	NA		52.4	J-	NA		NA	
HSS-C-0-101-07-270	02/01/06	11/27/06	Surface	FD	mg/kg	NA		**7.8**	J-	NA		**3,830**	J-	NA		112	J-	NA		NA	
HSS-C-0-101-07-284	02/01/06	08/21/07	Surface	REG	mg/kg	NA		**19.0**	J-	NA		**6,750**	J-	NA		165	J-	NA		NA	
HSS-C-0-101-07-286	02/01/06	08/21/07	Surface	REG	mg/kg	NA		**17.0**	J-	NA		3,050	J-	NA		114	J-	NA		NA	
HSS-C-0-101-07-301	02/01/06	08/21/07	Surface	REG	mg/kg	NA		**16.4**	J-	NA		**4,890**	J-	NA		186	J-	NA		NA	
HSS-C-0-101-07-303	02/01/06	08/21/07	Surface	REG	mg/kg	NA		**5.2**	J-	NA		726	J-	NA		33.6	J-	NA		NA	
HSS-C-0-101-07-304A	02/01/06	08/21/07	Surface	REG	mg/kg	NA		**8.8**	J-	NA		1,910	J-	NA		35.0	J-	NA		NA	
HSS-C-0-101-09-004	02/07/06	11/20/06	Surface	REG	mg/kg	NA		**30.3**	J-	NA		**3,910**	J-	NA		318	J-	NA		NA	
HSS-C-0-101-09-004	02/07/06	11/20/06	Surface	FD	mg/kg	NA		**32.8**	J-	NA		**4,540**	J-	NA		392	J-	NA		NA	
HSS-C-0-101-09-008	02/07/06	11/20/06	Surface	REG	mg/kg	NA		**10.2**	J-	NA		1,230	J-	NA		43.5	J-	NA		NA	
HSS-C-0-101-09-010	02/07/06	11/20/06	Surface	REG	mg/kg	NA		**41.7**	J-	NA		**7,600**	J-	NA		379	J-	NA		NA	
HSS-C-0-101-09-014	02/06/06	08/21/07	Surface	REG	mg/kg	NA		**9.9**	J-	NA		1,940	J-	NA		99.3	J-	NA		NA	
HSS-C-0-101-09-025A	02/07/06	08/21/07	Surface	REG	mg/kg	NA		**10.4**	J-	NA		2,440	J-	NA		148	J-	NA		NA	
HSS-C-0-101-09-027	02/07/06	02/08/06	Surface	REG	mg/kg	0.88	J	**8.5**		1.3		1,380		17,300		193		0.77	J	37.2	
HSS-C-0-101-09-032	02/07/06	11/27/06	Surface	REG	mg/kg	NA		**40.8**	J-	NA		**9,180**	J-	NA		328	J-	NA		NA	
HSS-C-0-101-09-033	02/06/06	02/08/06	Surface	REG	mg/kg	2.3	J	**29.1**		7.5		**7,770**		**23,400**		**462**		4.6		38.9	
HSS-C-0-101-09-036	02/09/06	11/20/06	Surface	REG	mg/kg	NA		**49.3**	J-	NA		**7,880**	J-	NA		**2,550**	J-	NA		NA	
HSS-C-0-101-09-038	02/09/06	11/20/06	Surface	REG	mg/kg	NA		**44.1**	J-	NA		**9,080**	J-	NA		251	J-	NA		NA	
HSS-C-0-101-09-038	02/09/06	11/20/06	Surface	FD	mg/kg	NA		**47.3**	J-	NA		**9,540**	J-	NA		233	J-	NA		NA	
HSS-C-0-101-09-039	02/10/06	08/21/07	Surface	REG	mg/kg	NA		**16.9**	J-	NA		**4,120**	J-	NA		176	J-	NA		NA	
HSS-C-0-101-09-042	02/09/06	08/21/07	Surface	REG	mg/kg	NA		**12.8**	J-	NA		3,000	J-	NA		323	J-	NA		NA	
HSS-C-0-101-09-045	02/10/06	08/21/07	Surface	REG	mg/kg	NA		**5.0**	J-	NA		1,280	J-	NA		31.1	J-	NA		NA	
HSS-C-0-101-09-047	02/09/06	08/21/07	Surface	REG	mg/kg	NA		**25.6**	J-	NA		**3,360**	J-	NA		**1,170**	J-	NA		NA	
HSS-C-0-101-09-054	02/10/06	08/21/07	Surface	REG	mg/kg	NA		**29.5**	J-	NA		**7,850**	J-	NA		**550**	J-	NA		NA	
HSS-C-0-101-09-059	02/07/06	08/21/07	Surface	REG	mg/kg	NA		**19.7**	J-	NA		**9,390**	J-	NA		155	J-	NA		NA	
HSS-C-0-101-09-062	02/08/06	08/21/07	Surface	REG	mg/kg	NA		**11.1**	J-	NA		2,630	J-	NA		**447**	J-	NA		NA	
HSS-C-0-101-09-064	02/08/06	02/10/06	Surface	REG	mg/kg	1.3	J	**12.6**		3.1		**5,410**		19,200		151		4.3		39	
HSS-C-0-101-09-067	02/08/06	11/20/06	Surface	REG	mg/kg	NA		**35**	J-	NA		**5,060**	J-	NA		**1,390**	J-	NA		NA	
HSS-C-0-101-09-068	02/08/06	08/21/07	Surface	REG	mg/kg	NA		**13.1**	J-	NA		2,890	J-	NA		**512**	J-	NA		NA	
HSS-C-0-101-09-070	02/07/06	02/08/06	Surface	REG	mg/kg	1.5	J	**19.1**		3.2		**3,420**		**23,500**		305		2.1		42.2	
HSS-C-0-101-09-070	02/07/06	02/08/06	Surface	FD	mg/kg	1.4	J	**16.9**		2.3		2,740		20,000		312		1.6		35.4	
HSS-C-0-101-09-072	02/07/06	08/21/07	Surface	REG	mg/kg	NA		**31.0**	J-	NA		**6,760**	J-	NA		155	J-	NA		NA	
HSS-C-0-101-09-077	02/08/06	02/10/06	Surface	REG	mg/kg	1.5	J	**46.3**		6.4		**6,480**		**23,700**		**7,250**		5.2		46.2	
HSS-C-0-101-09-077	02/08/06	11/20/06	Surface	REG	mg/kg	NA		**50.3**	J-	NA		**5,790**	J-	NA		**4,270**	J-	NA		NA	
HSS-C-0-101-09-077	02/08/06	09/14/07	Surface	REG	mg/kg	NA		**66.3**	J-	NA		**6,590**	J-	NA		**1,970**	J-	NA		NA	
HSS-C-0-101-09-083	02/10/06	02/10/06	Surface	REG	mg/kg	1	J	**8.9**		1.2		1,380		16,500		209		0.71	J	36.8	

TABLE 4-9
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Arizona Residential Soil Remediation Level[1] (mg/kg):						**31**		**10**		**39**		**3,100**		**--**		**400**		**390**		**78**	
EPA Region IX Preliminary Remediation Goal[2] (mg/kg):						**31**		**0.39**		**37**		**3,100**		**23,000**		**400**		**390**		**78**	
Location/	**Sample**	**Shipment**		**Sample**		**Antimony**		**Arsenic**		**Cadmium**		**Copper**		**Iron**		**Lead**		**Silver**		**Vanadium**	
Parcel ID	**Date**	**Date**	**Depth**	**Type**	**Units**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**
HSS-C-0-101-09-084	02/10/06	11/20/06	Surface	REG	mg/kg	NA		**35.4**		NA		**6,510**		NA		**1,300**	J	NA		NA	
HSS-C-0-101-09-088	02/10/06	11/20/06	Surface	REG	mg/kg	NA		**2.9**	J-	NA		272	J-	NA		25.7	J-	NA		NA	
HSS-C-0-101-09-104	02/08/06	11/20/06	Surface	REG	mg/kg	NA		**27.1**	J-	NA		**9,620**	J-	NA		177	J-	NA		NA	
HSS-C-0-101-09-106	02/08/06	11/20/06	Surface	REG	mg/kg	NA		**17.1**	J-	NA		**5,130**	J-	NA		90.3	J-	NA		NA	
HSS-C-0-101-09-107	02/08/06	11/20/06	Surface	REG	mg/kg	NA		**27.6**	J-	NA		**7,020**	J-	NA		310	J-	NA		NA	
HSS-C-0-101-09-107	02/08/06	11/20/06	Surface	FD	mg/kg	NA		**28.2**	J-	NA		**7,180**	J-	NA		323	J-	NA		NA	
HSS-C-0-101-09-108	02/08/06	11/20/06	Surface	REG	mg/kg	NA		**45.9**		NA		**10,200**		NA		**2,100**		NA		NA	
HSS-C-0-101-09-109	02/09/06	11/20/06	Surface	REG	mg/kg	NA		**19.7**	J-	NA		**6,140**	J-	NA		217	J-	NA		NA	
HSS-C-0-101-09-111B	02/09/06	11/20/06	Surface	REG	mg/kg	NA		**19.1**	J-	NA		**5,220**	J-	NA		90.9	J-	NA		NA	
HSS-C-0-101-09-115	02/09/06	11/20/06	Surface	REG	mg/kg	NA		**27.2**	J-	NA		**6,710**	J-	NA		141	J-	NA		NA	
HSS-C-0-101-09-120	02/09/06	02/10/06	Surface	REG	mg/kg	2.3	J	**36**		9.1		**9,000**		**27,600**		208		7.8		49	
HSS-C-0-101-09-120	02/09/06	11/20/06	Surface	REG	mg/kg	NA		**45.5**	J-	NA		**8,690**	J-	NA		232	J-	NA		NA	
HSS-C-0-101-09-134	02/10/06	08/21/07	Surface	REG	mg/kg	NA		**11.7**	J-	NA		1,690	J-	NA		53.2	J-	NA		NA	
HSS-C-0-101-09-137	02/08/06	08/22/07	Surface	REG	mg/kg	NA		**17.4**	J	NA		**3,690**		NA		78.8	J	NA		NA	
HSS-C-0-101-09-140	02/08/06	08/22/07	Surface	REG	mg/kg	NA		**34.0**	J	NA		**9,040**		NA		140	J	NA		NA	
HSS-C-1-101-07-029	02/06/06	11/20/06	Subsurface	REG	mg/kg	NA		**8.2**	J-	NA		967	J-	NA		44.2	J-	NA		NA	
HSS-C-1-101-07-035AS	02/09/06	11/20/06	Subsurface	REG	mg/kg	NA		**18.3**	J-	NA		**3,790**	J-	NA		81.4	J-	NA		NA	
HSS-C-1-101-07-052	02/02/06	11/20/06	Subsurface	REG	mg/kg	NA		**8.9**	J-	NA		297	J-	NA		10.2	J-	NA		NA	
HSS-C-1-101-07-176	01/31/06	11/20/06	Subsurface	REG	mg/kg	NA		**4.6**	J-	NA		544	J-	NA		36.5	J-	NA		NA	
HSS-C-1-101-07-185C	01/31/06	08/22/07	Subsurface	REG	mg/kg	NA		**7.6**	J-	NA		121	J-	NA		22.4	J-	NA		NA	
HSS-C-1-101-07-193A	01/31/06	08/22/07	Subsurface	REG	mg/kg	NA		**6.6**	J-	NA		478	J-	NA		117	J-	NA		NA	
HSS-C-1-101-07-259	01/31/06	08/21/07	Subsurface	REG	mg/kg	NA		**3.5**	J-	NA		463	J-	NA		93.7	J-	NA		NA	
HSS-C-1-101-09-008	02/07/06	11/20/06	Subsurface	REG	mg/kg	NA		**5.7**	J-	NA		172	J-	NA		12.1	J-	NA		NA	
HSS-C-1-101-09-008	02/07/06	11/20/06	Subsurface	FD	mg/kg	NA		**6**	J-	NA		167	J-	NA		13	J-	NA		NA	
HSS-C-1-101-09-025A	02/07/06	08/21/07	Subsurface	REG	mg/kg	NA		**11.5**	J-	NA		428	J-	NA		37.1	J-	NA		NA	
HSS-C-1-101-09-088	02/10/06	11/20/06	Subsurface	REG	mg/kg	NA		**3.1**		NA		123		NA		23.6	J	NA		NA	
HSS-C-1-101-09-088	02/10/06	11/20/06	Subsurface	FD	mg/kg	NA		**3**		NA		122		NA		21.9	J	NA		NA	
HSS-C-1-101-09-108	02/02/06	11/20/06	Subsurface	REG	mg/kg	NA		**58.1**		NA		**11,300**		NA		**936**		NA		NA	
HSS-D-0-101-07-008	02/09/06	02/10/06	Surface	REG	mg/kg	4	J	**92.8**		15.1		**20,200**		**26,100**		362		13.2		48.8	
HSS-D-0-101-07-008	02/09/06	11/27/06	Surface	REG	mg/kg	NA		**113**	J-	NA		**20,200**	J-	NA		388	J-	NA		NA	
HSS-D-0-101-07-010	02/09/06	11/20/06	Surface	REG	mg/kg	NA		**10.2**	J-	NA		1,960	J-	NA		36.2	J-	NA		NA	
HSS-D-0-101-07-014	02/03/06	02/03/06	Surface	REG	mg/kg	1.3	J	**19.1**		4.4		**6,250**		20,500		**536**		4.4		44.6	
HSS-D-0-101-07-014	02/03/06	11/27/06	Surface	REG	mg/kg	NA		**20.6**	J-	NA		**7,900**	J-	NA		**411**	J-	NA		NA	
HSS-D-0-101-07-018	02/06/06	11/27/06	Surface	REG	mg/kg	NA		**21.5**	J-	NA		**7,960**	J-	NA		173	J-	NA		NA	
HSS-D-0-101-07-027	02/06/06	02/08/06	Surface	REG	mg/kg	1.8	J	**14.5**		5.3		**6,110**		22,300		165		4.1		41.3	
HSS-D-0-101-07-027	02/06/06	02/08/06	Surface	FD	mg/kg	1.5	J	**14.2**		5.6		**6,110**		20,400		171		4		37.9	

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Arizona Residential Soil Remediation Level[1] (mg/kg):						**31**		**10**		**39**		**3,100**		**--**		**400**		**390**		**78**	
EPA Region IX Preliminary Remediation Goal[2] (mg/kg):						**31**		**0.39**		**37**		**3,100**		**23,000**		**400**		**390**		**78**	
Location/	**Sample**	**Shipment**		**Sample**		**Antimony**		**Arsenic**		**Cadmium**		**Copper**		**Iron**		**Lead**		**Silver**		**Vanadium**	
Parcel ID	**Date**	**Date**	**Depth**	**Type**	**Units**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**
HSS-D-0-101-07-028	02/06/06	11/20/06	Surface	REG	mg/kg	NA		**51.1**	J-	NA		**17,500**	J-	NA		**436**	J-	NA		NA	
HSS-D-0-101-07-029	02/06/06	11/20/06	Surface	REG	mg/kg	NA		**53.3**	J-	NA		**10,000**	J-	NA		367	J-	NA		NA	
HSS-D-0-101-07-030	02/06/06	11/20/06	Surface	REG	mg/kg	NA		**33.4**	J-	NA		**15,600**	J-	NA		228	J-	NA		NA	
HSS-D-0-101-07-034	02/09/06	11/20/06	Surface	REG	mg/kg	NA		**29.1**	J-	NA		**5,450**	J-	NA		128	J-	NA		NA	
HSS-D-0-101-07-035AE	02/09/06	08/21/07	Surface	REG	mg/kg	NA		**16.7**	J-	NA		2,450	J-	NA		38.4	J-	NA		NA	
HSS-D-0-101-07-035AN	02/09/06	11/20/06	Surface	REG	mg/kg	NA		**67.3**	J-	NA		**13,300**	J-	NA		156	J-	NA		NA	
HSS-D-0-101-07-035AS	02/09/06	11/20/06	Surface	REG	mg/kg	NA		**29.9**	J-	NA		**15,400**	J-	NA		146	J-	NA		NA	
HSS-D-0-101-07-037	02/03/06	11/20/06	Surface	REG	mg/kg	NA		**9.9**	J-	NA		2,270	J-	NA		83.1	J-	NA		NA	
HSS-D-0-101-07-037	02/03/06	11/20/06	Surface	FD	mg/kg	NA		**8.4**	J-	NA		1,650	J-	NA		72.3	J-	NA		NA	
HSS-D-0-101-07-040	02/03/06	11/20/06	Surface	REG	mg/kg	NA		**19.3**	J-	NA		**8,150**	J-	NA		77.9	J-	NA		NA	
HSS-D-0-101-07-041	02/03/06	08/21/07	Surface	REG	mg/kg	NA		**17.6**	J-	NA		**4,310**	J-	NA		215	J-	NA		NA	
HSS-D-0-101-07-042	02/03/06	08/21/07	Surface	REG	mg/kg	NA		**5.3**	J-	NA		1,380	J-	NA		91.4	J-	NA		NA	
HSS-D-0-101-07-046	02/06/06	08/21/07	Surface	REG	mg/kg	NA		**17.4**	J-	NA		**5,680**	J-	NA		**1,270**	J-	NA		NA	
HSS-D-0-101-07-047	02/06/06	02/08/06	Surface	REG	mg/kg	4.1	J	**50.1**		12.8		**15,100**		**48,700**		**856**		10.2		50.9	
HSS-D-0-101-07-047	02/06/06	11/27/06	Surface	REG	mg/kg	NA		**65.3**		NA		**16,100**		NA		**827**	J	NA		NA	
HSS-D-0-101-07-047	02/06/06	09/14/07	Surface	REG	mg/kg	NA		**69.3**	J-	NA		**15,600**	J-	NA		**915**	J-	NA		NA	
HSS-D-0-101-07-050A	02/03/06	08/21/07	Surface	REG	mg/kg	NA		**7.7**	J-	NA		**3,460**	J-	NA		90.4	J-	NA		NA	
HSS-D-0-101-07-052	02/02/06	02/03/06	Surface	REG	mg/kg	3.8	J	**56.2**		9.5		**15,900**		**29,700**		363		11.7		45.7	
HSS-D-0-101-07-052	02/02/06	11/27/06	Surface	REG	mg/kg	NA		**52.4**	J-	NA		**11,600**	J-	NA		344	J-	NA		NA	
HSS-D-0-101-07-060	02/02/06	08/21/07	Surface	REG	mg/kg	NA		**19.7**	J-	NA		**4,360**	J-	NA		130	J-	NA		NA	
HSS-D-0-101-07-061	02/02/06	08/21/07	Surface	REG	mg/kg	NA		**35.0**	J-	NA		**8,990**	J-	NA		276	J-	NA		NA	
HSS-D-0-101-07-062	02/06/06	11/27/06	Surface	REG	mg/kg	NA		**16.7**		NA		**4,420**		NA		89.1	J	NA		NA	
HSS-D-0-101-07-065	02/06/06	08/22/07	Surface	REG	mg/kg	NA		**4.9**	J-	NA		633	J-	NA		38.8	J-	NA		NA	
HSS-D-0-101-07-066	02/06/06	08/21/07	Surface	REG	mg/kg	NA		**9.9**	J-	NA		2,850	J-	NA		80.1	J-	NA		NA	
HSS-D-0-101-07-082	02/06/06	08/21/07	Surface	REG	mg/kg	NA		**17.9**	J-	NA		**3,920**	J-	NA		185	J-	NA		NA	
HSS-D-0-101-07-089K	02/07/06	11/20/06	Surface	REG	mg/kg	NA		**26.6**	J-	NA		**8,390**	J-	NA		97.5	J-	NA		NA	
HSS-D-0-101-07-089Q	02/02/06	08/22/07	Surface	REG	mg/kg	NA		**56.9**	J-	NA		**17,400**	J-	NA		259	J-	NA		NA	
HSS-D-0-101-07-089S	02/07/06	02/08/06	Surface	REG	mg/kg	3.4	J	**70.6**		12.3		**25,200**		**33,700**		276		16.6		60.9	
HSS-D-0-101-07-089S	02/07/06	11/20/06	Surface	REG	mg/kg	NA		**87.9**	J-	NA		**23,900**	J-	NA		265	J-	NA		NA	
HSS-D-0-101-07-089T	02/07/06	02/08/06	Surface	REG	mg/kg	3.5	J	**51.8**		7.8		**15,400**		**27,200**		197		8.2		52.3	
HSS-D-0-101-07-089T	02/07/06	11/27/06	Surface	REG	mg/kg	NA		**63.6**		NA		**15,500**		NA		189	J	NA		NA	
HSS-D-0-101-07-089U	02/07/06	11/20/06	Surface	REG	mg/kg	NA		**29**	J-	NA		**9,050**	J-	NA		100	J-	NA		NA	
HSS-D-0-101-07-090	02/02/06	02/03/06	Surface	REG	mg/kg	2.2	J	**20**		4		**12,600**		**32,200**		178		7.3		63.6	
HSS-D-0-101-07-090	02/02/06	11/27/06	Surface	REG	mg/kg	NA		**40.1**	J-	NA		**15,400**	J-	NA		223	J-	NA		NA	
HSS-D-0-101-07-091	02/02/06	11/20/06	Surface	REG	mg/kg	NA		**72.9**	J-	NA		**24,200**	J-	NA		358	J-	NA		NA	
HSS-D-0-101-07-092A	02/02/06	08/21/07	Surface	REG	mg/kg	NA		**11.0**	J-	NA		**5,350**	J-	NA		56.5	J-	NA		NA	

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Arizona Residential Soil Remediation Level[1] (mg/kg):						**31**		**10**		**39**		**3,100**		**--**		**400**		**390**		**78**	
EPA Region IX Preliminary Remediation Goal[2] (mg/kg):						**31**		**0.39**		**37**		**3,100**		**23,000**		**400**		**390**		**78**	
Location/	**Sample**	**Shipment**		**Sample**		**Antimony**		**Arsenic**		**Cadmium**		**Copper**		**Iron**		**Lead**		**Silver**		**Vanadium**	
Parcel ID	**Date**	**Date**	**Depth**	**Type**	**Units**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**
HSS-D-0-101-07-099	02/01/06	02/03/06	Surface	REG	mg/kg	2.5	J	**51.8**		11.1		**14,400**		**34,300**		278		4.7		62	
HSS-D-0-101-07-104	02/01/06	08/21/07	Surface	REG	mg/kg	NA		**16.8**	J-	NA		**5,590**	J-	NA		70.0	J-	NA		NA	
HSS-D-0-101-07-105	02/02/06	11/20/06	Surface	REG	mg/kg	NA		**39.8**	J-	NA		**11,100**	J-	NA		**437**	J-	NA		NA	
HSS-D-0-101-07-110	02/02/06	08/21/07	Surface	REG	mg/kg	NA		**25.1**	J-	NA		**7,550**	J-	NA		93.0	J-	NA		NA	
HSS-D-0-101-07-111	02/01/06	08/21/07	Surface	REG	mg/kg	NA		**13.1**	J-	NA		**4,640**	J-	NA		47.8	J-	NA		NA	
HSS-D-0-101-07-117	02/01/06	11/27/06	Surface	REG	mg/kg	NA		**16.3**	J-	NA		**4,360**	J-	NA		157	J-	NA		NA	
HSS-D-0-101-07-117	02/01/06	11/27/06	Surface	FD	mg/kg	NA		**13.6**	J-	NA		**3,440**	J-	NA		130	J-	NA		NA	
HSS-D-0-101-07-129	02/01/06	02/03/06	Surface	REG	mg/kg	0.85	J	**10.4**		4.7		2,260		22,700		185		1.2		48.3	
HSS-D-0-101-07-142A	01/31/06	08/21/07	Surface	REG	mg/kg	NA		**31.5**	J-	NA		**4,690**	J-	NA		185	J-	NA		NA	
HSS-D-0-101-07-149	01/31/06	08/22/07	Surface	REG	mg/kg	NA		**18.2**	J-	NA		**3,680**	J-	NA		289	J-	NA		NA	
HSS-D-0-101-07-176	01/31/06	02/02/06	Surface	REG	mg/kg	1.2	J	**11.2**		2.8		**3,280**		22,100		138		3.1		47.5	
HSS-D-0-101-07-185C	01/31/06	08/22/07	Surface	REG	mg/kg	NA		**9.0**	J-	NA		1,210	J-	NA		52.0	J-	NA		NA	
HSS-D-0-101-07-193A	01/31/06	08/22/07	Surface	REG	mg/kg	NA		**11.0**	J-	NA		1,430	J-	NA		63.1	J-	NA		NA	
HSS-D-0-101-07-202	01/31/06	08/21/07	Surface	REG	mg/kg	NA		**10.3**	J-	NA		1,620	J-	NA		92.1	J-	NA		NA	
HSS-D-0-101-07-216	01/30/06	08/21/07	Surface	REG	mg/kg	NA		**10.1**	J-	NA		2,110	J-	NA		103	J-	NA		NA	
HSS-D-0-101-07-219	01/31/06	08/21/07	Surface	REG	mg/kg	NA		**17.3**	J-	NA		**4,660**	J-	NA		106	J-	NA		NA	
HSS-D-0-101-07-234	02/01/06	08/21/07	Surface	REG	mg/kg	NA		**8.0**	J-	NA		2,060	J-	NA		38.1	J-	NA		NA	
HSS-D-0-101-07-236	02/01/06	08/21/07	Surface	REG	mg/kg	NA		**14.3**	J-	NA		**4,280**	J-	NA		169	J-	NA		NA	
HSS-D-0-101-07-242	01/31/06	08/21/07	Surface	REG	mg/kg	NA		**21.3**	J-	NA		**6,530**	J-	NA		165	J-	NA		NA	
HSS-D-0-101-07-244	02/01/06	08/21/07	Surface	REG	mg/kg	NA		**4.8**	J-	NA		1,230	J-	NA		105	J-	NA		NA	
HSS-D-0-101-07-247	01/31/06	08/21/07	Surface	REG	mg/kg	NA		**8.2**	J-	NA		2,020	J-	NA		210	J-	NA		NA	
HSS-D-0-101-07-251	01/31/06	08/21/07	Surface	REG	mg/kg	NA		**12.0**	J-	NA		2,480	J-	NA		127	J-	NA		NA	
HSS-D-0-101-07-259	01/31/06	08/21/07	Surface	REG	mg/kg	NA		**4.7**	J-	NA		1,110	J-	NA		40.4	J-	NA		NA	
HSS-D-0-101-07-270	02/01/06	11/27/06	Surface	REG	mg/kg	NA		**80.3**	J-	NA		**17,300**	J-	NA		**1,300**	J-	NA		NA	
HSS-D-0-101-07-284	02/01/06	08/21/07	Surface	REG	mg/kg	NA		**16.5**	J-	NA		**4,410**	J-	NA		134	J-	NA		NA	
HSS-D-0-101-07-286	02/01/06	08/21/07	Surface	REG	mg/kg	NA		**16.3**	J-	NA		**4,650**	J-	NA		159	J-	NA		NA	
HSS-D-0-101-07-301	02/01/06	08/21/07	Surface	REG	mg/kg	NA		**19.4**	J-	NA		**7,170**	J-	NA		166	J-	NA		NA	
HSS-D-0-101-07-303	02/01/06	08/21/07	Surface	REG	mg/kg	NA		**5.0**	J-	NA		918	J-	NA		57.1	J-	NA		NA	
HSS-D-0-101-07-304A	02/01/06	08/21/07	Surface	REG	mg/kg	NA		**8.6**	J-	NA		2,200	J-	NA		38.3	J-	NA		NA	
HSS-D-0-101-09-004	02/07/06	11/20/06	Surface	REG	mg/kg	NA		**48.5**	J-	NA		**8,130**	J-	NA		374	J-	NA		NA	
HSS-D-0-101-09-008	02/07/06	11/20/06	Surface	REG	mg/kg	NA		**9.6**	J-	NA		1,760	J-	NA		140	J-	NA		NA	
HSS-D-0-101-09-010	02/07/06	11/20/06	Surface	REG	mg/kg	NA		**27.2**	J-	NA		**6,820**	J-	NA		276	J-	NA		NA	
HSS-D-0-101-09-014	02/06/06	08/21/07	Surface	REG	mg/kg	NA		**9.0**	J-	NA		2,120	J-	NA		140	J-	NA		NA	
HSS-D-0-101-09-025A	02/07/06	08/21/07	Surface	REG	mg/kg	NA		**13.6**	J-	NA		**3,390**	J-	NA		158	J-	NA		NA	
HSS-D-0-101-09-027	02/07/06	08/21/07	Surface	REG	mg/kg	NA		**9.6**	J-	NA		1,860	J-	NA		242	J-	NA		NA	
HSS-D-0-101-09-032	02/07/06	11/27/06	Surface	REG	mg/kg	NA		**24.8**	J-	NA		**4,000**	J-	NA		**453**	J-	NA		NA	

TABLE 4-9
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Arizona Residential Soil Remediation Level[1] (mg/kg):						**31**		**10**		**39**		**3,100**		**--**		**400**		**390**		**78**	
EPA Region IX Preliminary Remediation Goal[2] (mg/kg):						**31**		**0.39**		**37**		**3,100**		**23,000**		**400**		**390**		**78**	
Location/	**Sample**	**Shipment**		**Sample**		**Antimony**		**Arsenic**		**Cadmium**		**Copper**		**Iron**		**Lead**		**Silver**		**Vanadium**	
Parcel ID	**Date**	**Date**	**Depth**	**Type**	**Units**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**
HSS-D-0-101-09-033	02/06/06	11/27/06	Surface	REG	mg/kg	NA		**25.3**	J-	NA		2,340	J-	NA		150	J-	NA		NA	
HSS-D-0-101-09-033	02/06/06	11/27/06	Surface	FD	mg/kg	NA		**33.8**	J-	NA		**4,570**	J-	NA		242	J-	NA		NA	
HSS-D-0-101-09-036	02/09/06	11/20/06	Surface	REG	mg/kg	NA		**14.5**	J-	NA		2,250	J-	NA		**734**	J-	NA		NA	
HSS-D-0-101-09-038	02/09/06	02/10/06	Surface	REG	mg/kg	3.8	J	**64.5**		13.5		**14,900**		**24,600**		**402**		9.6		39.9	
HSS-D-0-101-09-038	02/09/06	11/20/06	Surface	REG	mg/kg	NA		**82.7**	J-	NA		**14,400**	J-	NA		**460**	J-	NA		NA	
HSS-D-0-101-09-039	02/10/06	08/21/07	Surface	REG	mg/kg	NA		**7.6**	J-	NA		1,350	J-	NA		44.9	J-	NA		NA	
HSS-D-0-101-09-042	02/09/06	08/21/07	Surface	REG	mg/kg	NA		**9.7**	J-	NA		**3,410**	J-	NA		383	J-	NA		NA	
HSS-D-0-101-09-045	02/10/06	08/21/07	Surface	REG	mg/kg	NA		**12.5**	J-	NA		**6,360**	J-	NA		107	J-	NA		NA	
HSS-D-0-101-09-047	02/09/06	08/21/07	Surface	REG	mg/kg	NA		**15.8**	J-	NA		**3,900**	J-	NA		368	J-	NA		NA	
HSS-D-0-101-09-054	02/10/06	08/21/07	Surface	REG	mg/kg	NA		**12.6**	J-	NA		3,070	J-	NA		124	J-	NA		NA	
HSS-D-0-101-09-059	02/07/06	08/21/07	Surface	REG	mg/kg	NA		**13.3**	J-	NA		**4,220**	J-	NA		299	J-	NA		NA	
HSS-D-0-101-09-062	02/08/06	08/21/07	Surface	REG	mg/kg	NA		**14.6**	J-	NA		**4,110**	J-	NA		**514**	J-	NA		NA	
HSS-D-0-101-09-064	02/08/06	11/20/06	Surface	REG	mg/kg	NA		**42.1**		NA		**10,700**		NA		294		NA		NA	
HSS-D-0-101-09-067	02/08/06	11/20/06	Surface	REG	mg/kg	NA		**34**	J-	NA		**5,660**	J-	NA		**1,080**	J-	NA		NA	
HSS-D-0-101-09-067	02/08/06	11/20/06	Surface	FD	mg/kg	NA		**35.6**	J-	NA		**5,880**	J-	NA		**1,000**	J-	NA		NA	
HSS-D-0-101-09-068	02/08/06	08/21/07	Surface	REG	mg/kg	NA		**15.0**	J-	NA		**3,450**	J-	NA		269	J-	NA		NA	
HSS-D-0-101-09-070	02/07/06	11/20/06	Surface	REG	mg/kg	NA		**8.3**	J-	NA		2,200	J-	NA		163	J-	NA		NA	
HSS-D-0-101-09-072	02/07/06	02/08/06	Surface	REG	mg/kg	1.4	J	**7.2**		1.2		**3,550**		14,900		62.5		1.9		27.2	
HSS-D-0-101-09-077	02/08/06	02/10/06	Surface	REG	mg/kg	1.1	J	**19.4**		4.3		**4,840**		20,200		266		2.9		40.5	
HSS-D-0-101-09-083	02/10/06	08/21/07	Surface	REG	mg/kg	NA		**12.8**	J-	NA		**3,340**	J-	NA		**520**	J-	NA		NA	
HSS-D-0-101-09-084	02/10/06	11/20/06	Surface	REG	mg/kg	NA		**36.6**		NA		**7,750**		NA		**1,060**	J	NA		NA	
HSS-D-0-101-09-088	02/10/06	11/20/06	Surface	REG	mg/kg	NA		**5.5**	J-	NA		715	J-	NA		62.3	J-	NA		NA	
HSS-D-0-101-09-104	02/08/06	11/20/06	Surface	REG	mg/kg	NA		**31.2**	J-	NA		**7,040**	J-	NA		296	J-	NA		NA	
HSS-D-0-101-09-104	02/08/06	11/20/06	Surface	FD	mg/kg	NA		**34.6**	J-	NA		**6,670**	J-	NA		306	J-	NA		NA	
HSS-D-0-101-09-106	02/08/06	02/10/06	Surface	REG	mg/kg	2.6	J	**64.7**		13.1		**15,800**		**33,500**		**2,990**		14.1		59.3	
HSS-D-0-101-09-106	02/08/06	11/27/06	Surface	REG	mg/kg	NA		**88.3**	J-	NA		**15,300**	J-	NA		**1,210**	J-	NA		NA	
HSS-D-0-101-09-107	02/08/06	11/20/06	Surface	REG	mg/kg	NA		**25.3**	J-	NA		**4,930**	J-	NA		**402**	J-	NA		NA	
HSS-D-0-101-09-108	02/08/06	11/20/06	Surface	REG	mg/kg	NA		**27.5**		NA		**3,320**		NA		167		NA		NA	
HSS-D-0-101-09-108	02/08/06	11/20/06	Surface	FD	mg/kg	NA		**31.8**		NA		**3,590**		NA		218		NA		NA	
HSS-D-0-101-09-109	02/09/06	11/20/06	Surface	REG	mg/kg	NA		**38.4**	J-	NA		**15,800**	J-	NA		118	J-	NA		NA	
HSS-D-0-101-09-111B	02/09/06	11/20/06	Surface	REG	mg/kg	NA		**67.3**	J-	NA		**15,300**	J-	NA		**687**	J-	NA		NA	
HSS-D-0-101-09-115	02/09/06	02/10/06	Surface	REG	mg/kg	0.94	J	**8.9**		1.5		2,210		16,500		54.5		2.3		35.8	
HSS-D-0-101-09-115	02/09/06	11/20/06	Surface	REG	mg/kg	NA		**9**	J-	NA		2,310	J-	NA		57	J-	NA		NA	
HSS-D-0-101-09-120	02/09/06	11/20/06	Surface	REG	mg/kg	NA		**51.9**	J-	NA		**8,700**	J-	NA		289	J-	NA		NA	
HSS-D-0-101-09-134	02/10/06	02/10/06	Surface	REG	mg/kg	1.3	J	**11.5**		1.7		2,370		18,900		52.9		1.7		44	
HSS-D-0-101-09-134	02/10/06	02/10/06	Surface	FD	mg/kg	1.1	J	**11.7**		1.9		2,650		19,600		58.9		2.1		45.2	

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Arizona Residential Soil Remediation Level[1] (mg/kg):						**31**		**10**		**39**		**3,100**		**--**		**400**		**390**		**78**	
EPA Region IX Preliminary Remediation Goal[2] (mg/kg):						**31**		**0.39**		**37**		**3,100**		**23,000**		**400**		**390**		**78**	
Location/	**Sample**	**Shipment**		**Sample**		**Antimony**		**Arsenic**		**Cadmium**		**Copper**		**Iron**		**Lead**		**Silver**		**Vanadium**	
Parcel ID	**Date**	**Date**	**Depth**	**Type**	**Units**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**
HSS-D-0-101-09-137	02/08/06	08/22/07	Surface	REG	mg/kg	NA		**13.7**	J	NA		1,900		NA		33.2	J	NA		NA	
HSS-D-0-101-09-140	02/08/06	08/22/07	Surface	REG	mg/kg	NA		**294**	J-	NA		**76,600**	J-	NA		**1,370**	J-	NA		NA	
HSS-D-1-101-07-014	02/03/06	11/27/06	Subsurface	REG	mg/kg	NA		**3.6**	J-	NA		915	J-	NA		91.3	J-	NA		NA	
HSS-D-1-101-07-089Q	02/02/06	08/22/07	Subsurface	REG	mg/kg	NA		**11.6**	J	NA		1,950		NA		31.9	J	NA		NA	
HSS-D-1-101-07-091	02/02/06	11/20/06	Subsurface	REG	mg/kg	NA		**31.5**	J-	NA		**7,360**	J-	NA		327	J-	NA		NA	
HSS-D-1-101-07-105	02/02/06	11/20/06	Subsurface	REG	mg/kg	NA		**6.7**	J-	NA		608	J-	NA		37.5	J-	NA		NA	
HSS-D-1-101-07-105	02/02/06	11/20/06	Subsurface	FD	mg/kg	NA		**7.3**	J-	NA		576	J-	NA		38.4	J-	NA		NA	
HSS-D-1-101-07-110	02/02/06	08/21/07	Subsurface	REG	mg/kg	NA		**17.6**	J-	NA		**17,100**	J-	NA		57.2	J-	NA		NA	
HSS-D-1-101-07-301	02/01/06	08/21/07	Subsurface	REG	mg/kg	NA		**21.2**	J-	NA		2,470	J-	NA		116	J-	NA		NA	
HSS-D-1-101-09-036	02/09/06	11/20/06	Subsurface	REG	mg/kg	NA		**26.2**	J-	NA		**7,910**	J-	NA		**759**	J-	NA		NA	
HSS-D-1-101-09-062	02/08/06	08/21/07	Subsurface	REG	mg/kg	NA		**7.0**	J-	NA		476	J-	NA		50.9	J-	NA		NA	
HSS-D-1-101-09-064	02/08/06	11/20/06	Subsurface	REG	mg/kg	NA		**4.6**	J-	NA		1,420	J-	NA		183	J-	NA		NA	
HSS-E-0-101-07-008	02/09/06	11/20/06	Surface	REG	mg/kg	NA		**35.4**	J-	NA		**10,200**	J-	NA		176	J-	NA		NA	
HSS-E-0-101-07-010	02/09/06	02/10/06	Surface	REG	mg/kg	1.7	J	**20.4**		4.3		**5,740**		17,500		213		4.4		34.5	
HSS-E-0-101-07-010	02/09/06	11/20/06	Surface	REG	mg/kg	NA		**27.8**	J-	NA		**7,860**	J-	NA		223	J-	NA		NA	
HSS-E-0-101-07-014	02/03/06	11/27/06	Surface	REG	mg/kg	NA		**15.6**	J-	NA		**5,150**	J-	NA		82	J-	NA		NA	
HSS-E-0-101-07-018	02/06/06	11/27/06	Surface	REG	mg/kg	NA		**16.6**	J-	NA		**6,030**	J-	NA		180	J-	NA		NA	
HSS-E-0-101-07-018	02/06/06	11/27/06	Surface	FD	mg/kg	NA		**12.6**	J-	NA		**5,250**	J-	NA		173	J-	NA		NA	
HSS-E-0-101-07-027	02/06/06	08/21/07	Surface	REG	mg/kg	NA		**24.5**	J-	NA		**5,680**	J-	NA		179	J-	NA		NA	
HSS-E-0-101-07-028	02/06/06	11/20/06	Surface	REG	mg/kg	NA		**15.7**	J-	NA		**3,400**	J-	NA		112	J-	NA		NA	
HSS-E-0-101-07-028	02/06/06	11/20/06	Surface	FD	mg/kg	NA		**15.7**	J-	NA		**3,580**	J-	NA		108	J-	NA		NA	
HSS-E-0-101-07-029	02/06/06	11/20/06	Surface	REG	mg/kg	NA		**40**	J-	NA		**9,790**	J-	NA		**691**	J-	NA		NA	
HSS-E-0-101-07-030	02/06/06	11/20/06	Surface	REG	mg/kg	NA		**24.9**	J-	NA		**9,170**	J-	NA		237	J-	NA		NA	
HSS-E-0-101-07-034	02/09/06	11/20/06	Surface	REG	mg/kg	NA		**24.8**	J-	NA		**7,850**	J-	NA		**648**	J-	NA		NA	
HSS-E-0-101-07-035AE	02/09/06	08/21/07	Surface	REG	mg/kg	NA		**9.4**	J-	NA		2,420	J-	NA		31.7	J-	NA		NA	
HSS-E-0-101-07-035AN	02/09/06	11/20/06	Surface	REG	mg/kg	NA		**21.4**	J-	NA		**9,730**	J-	NA		14.1	J-	NA		NA	
HSS-E-0-101-07-035AS	02/09/06	11/20/06	Surface	REG	mg/kg	NA		**11.7**	J-	NA		**4,260**	J-	NA		79.5	J-	NA		NA	
HSS-E-0-101-07-037	02/03/06	11/20/06	Surface	REG	mg/kg	NA		**54.8**	J-	NA		**18,300**	J-	NA		**752**	J-	NA		NA	
HSS-E-0-101-07-040	02/03/06	11/20/06	Surface	REG	mg/kg	NA		**32.2**	J-	NA		**10,700**	J-	NA		149	J-	NA		NA	
HSS-E-0-101-07-041	02/03/06	08/21/07	Surface	REG	mg/kg	NA		**18.4**	J-	NA		**3,430**	J-	NA		294	J-	NA		NA	
HSS-E-0-101-07-042	02/03/06	02/03/06	Surface	REG	mg/kg	1.2	J	**13**		2.8		**4,000**		20,700		214		2.8		41.3	
HSS-E-0-101-07-042	02/03/06	09/14/07	Surface	REG	mg/kg	NA		**18.8**	J-	NA		**3,930**	J-	NA		218	J-	NA		NA	
HSS-E-0-101-07-046	02/06/06	02/08/06	Surface	REG	mg/kg	0.75	J	**10.9**		1.9		1,980		16,000		317		1.6		29.7	
HSS-E-0-101-07-047	02/06/06	11/27/06	Surface	REG	mg/kg	NA		**22.3**		NA		**6,120**		NA		327	J	NA		NA	
HSS-E-0-101-07-050A	02/03/06	08/21/07	Surface	REG	mg/kg	NA		**20.2**	J-	NA		**4,970**	J-	NA		200	J-	NA		NA	
HSS-E-0-101-07-052	02/02/06	11/20/06	Surface	REG	mg/kg	NA		**32.8**	J-	NA		**13,000**	J-	NA		179	J-	NA		NA	

TABLE 4-9
Soil Sampling Laboratory Value Exceedances for Full Inorganic Target Analyte List
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Arizona Residential Soil Remediation Level[1] (mg/kg):						**31**		**10**		**39**		**3,100**		**--**		**400**		**390**		**78**	
EPA Region IX Preliminary Remediation Goal[2] (mg/kg):						**31**		**0.39**		**37**		**3,100**		**23,000**		**400**		**390**		**78**	
Location/	**Sample**	**Shipment**		**Sample**		**Antimony**		**Arsenic**		**Cadmium**		**Copper**		**Iron**		**Lead**		**Silver**		**Vanadium**	
Parcel ID	**Date**	**Date**	**Depth**	**Type**	**Units**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**
HSS-E-0-101-07-060	02/02/06	08/21/07	Surface	REG	mg/kg	NA		**15.7**	J-	NA		**4,540**	J-	NA		217	J-	NA		NA	
HSS-E-0-101-07-061	02/02/06	08/21/07	Surface	REG	mg/kg	NA		**44.3**	J-	NA		**6,710**	J-	NA		182	J-	NA		NA	
HSS-E-0-101-07-062	02/02/06	11/27/06	Surface	REG	mg/kg	NA		**17.2**		NA		**5,180**		NA		75.9	J	NA		NA	
HSS-E-0-101-07-065	02/06/06	08/22/07	Surface	REG	mg/kg	NA		**9.4**	J-	NA		1,910	J-	NA		61.9	J-	NA		NA	
HSS-E-0-101-07-066	02/06/06	08/21/07	Surface	REG	mg/kg	NA		**12.8**	J-	NA		1,900	J-	NA		96.3	J-	NA		NA	
HSS-E-0-101-07-082	02/06/06	08/21/07	Surface	REG	mg/kg	NA		**18.3**	J-	NA		2,770	J-	NA		202	J-	NA		NA	
HSS-E-0-101-07-089K	02/07/06	11/20/06	Surface	REG	mg/kg	NA		**40.1**	J-	NA		**8,070**	J-	NA		121	J-	NA		NA	
HSS-E-0-101-07-089Q	02/02/06	08/22/07	Surface	REG	mg/kg	NA		**4.7**	J	NA		**3,930**		NA		24.7	J	NA		NA	
HSS-E-0-101-07-089S	02/07/06	02/08/06	Surface	REG	mg/kg	1.3	J	**57.7**		6.2		**8,180**		**25,100**		149		3.5		68.2	
HSS-E-0-101-07-089T	02/07/06	11/27/06	Surface	REG	mg/kg	NA		**32.4**		NA		**15,600**		NA		109	J	NA		NA	
HSS-E-0-101-07-089U	02/07/06	11/20/06	Surface	REG	mg/kg	NA		**46.8**	J-	NA		**12,000**	J-	NA		172	J-	NA		NA	
HSS-E-0-101-07-090	02/02/06	11/20/06	Surface	REG	mg/kg	NA		**26.5**	J-	NA		**8,660**	J-	NA		195	J-	NA		NA	
HSS-E-0-101-07-091	02/02/06	02/03/06	Surface	REG	mg/kg	1.9	J	**32.5**		5.2		**11,100**		**34,600**		198		6.2		**80.7**	
HSS-E-0-101-07-091	02/02/06	11/27/06	Surface	REG	mg/kg	NA		**48.9**	J-	NA		**10,800**	J-	NA		183	J-	NA		NA	
HSS-E-0-101-07-092A	02/02/06	08/21/07	Surface	REG	mg/kg	NA		**6.1**	J-	NA		1,600	J-	NA		35.1	J-	NA		NA	
HSS-E-0-101-07-099	02/01/06	11/20/06	Surface	REG	mg/kg	NA		**11.1**	J-	NA		3,020	J-	NA		104	J-	NA		NA	
HSS-E-0-101-07-104	02/01/06	08/21/07	Surface	REG	mg/kg	NA		**13.9**	J-	NA		**3,620**	J-	NA		63.3	J-	NA		NA	
HSS-E-0-101-07-105	02/02/06	11/20/06	Surface	REG	mg/kg	NA		**9.5**	J-	NA		**3,530**	J-	NA		59.1	J-	NA		NA	
HSS-E-0-101-07-110	02/02/06	08/21/07	Surface	REG	mg/kg	NA		**10.3**	J-	NA		2,550	J-	NA		30.1	J-	NA		NA	
HSS-E-0-101-07-111	02/01/06	08/21/07	Surface	REG	mg/kg	NA		**15.2**	J	NA		**6,020**		NA		150		NA		NA	
HSS-E-0-101-07-117	02/01/06	11/27/06	Surface	REG	mg/kg	NA		**16.9**	J-	NA		2,580	J-	NA		53.4	J-	NA		NA	
HSS-E-0-101-07-129	02/01/06	08/21/07	Surface	REG	mg/kg	NA		**24.3**	J	NA		**4,310**		NA		121		NA		NA	
HSS-E-0-101-07-142A	01/31/06	08/21/07	Surface	REG	mg/kg	NA		**12.7**	J-	NA		1,830	J-	NA		61.1	J-	NA		NA	
HSS-E-0-101-07-149	01/31/06	08/22/07	Surface	REG	mg/kg	NA		**18.2**	J-	NA		**3,180**	J-	NA		253	J-	NA		NA	
HSS-E-0-101-07-176	01/31/06	02/02/06	Surface	REG	mg/kg	1.1	J	**183**		2.3		1,590		22,700		191		1.9		36.9	
HSS-E-0-101-07-176	01/31/06	11/28/06	Surface	REG	mg/kg	NA		**213**	J-	NA		1,690	J-	NA		213	J-	NA		NA	
HSS-E-0-101-07-185C	01/31/06	09/14/07	Surface	REG	mg/kg	NA		**8.5**	J-	NA		1,290	J-	NA		42.4	J-	NA		NA	
HSS-E-0-101-07-193A	01/31/06	08/22/07	Surface	REG	mg/kg	NA		**8.0**	J-	NA		733	J-	NA		56.5	J-	NA		NA	
HSS-E-0-101-07-202	01/31/06	08/21/07	Surface	REG	mg/kg	NA		**14.5**	J-	NA		2,400	J-	NA		119	J-	NA		NA	
HSS-E-0-101-07-216	01/30/06	08/21/07	Surface	REG	mg/kg	NA		**9.3**	J-	NA		933	J-	NA		198	J-	NA		NA	
HSS-E-0-101-07-219	01/31/06	08/21/07	Surface	REG	mg/kg	NA		**25.8**	J-	NA		2,680	J-	NA		140	J-	NA		NA	
HSS-E-0-101-07-234	02/01/06	08/21/07	Surface	REG	mg/kg	NA		**11.0**	J-	NA		1,510	J-	NA		352	J-	NA		NA	
HSS-E-0-101-07-236	02/01/06	08/21/07	Surface	REG	mg/kg	NA		**21.0**	J-	NA		**3,650**	J-	NA		208	J-	NA		NA	
HSS-E-0-101-07-242	01/31/06	08/21/07	Surface	REG	mg/kg	NA		**18.8**	J-	NA		**4,630**	J-	NA		119	J-	NA		NA	
HSS-E-0-101-07-244	02/01/06	08/21/07	Surface	REG	mg/kg	NA		**8.9**	J-	NA		2,080	J-	NA		120	J-	NA		NA	
HSS-E-0-101-07-247	01/31/06	02/02/06	Surface	REG	mg/kg	0.94	J	**7.4**		2.9		2,000		20,700		149		1.5		62.4	

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Arizona Residential Soil Remediation Level[1] (mg/kg):						**31**		**10**		**39**		**3,100**		**--**		**400**		**390**		**78**	
EPA Region IX Preliminary Remediation Goal[2] (mg/kg):						**31**		**0.39**		**37**		**3,100**		**23,000**		**400**		**390**		**78**	
Location/	**Sample**	**Shipment**		**Sample**		**Antimony**		**Arsenic**		**Cadmium**		**Copper**		**Iron**		**Lead**		**Silver**		**Vanadium**	
Parcel ID	**Date**	**Date**	**Depth**	**Type**	**Units**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**
HSS-E-0-101-07-247	01/31/06	02/02/06	Surface	FD	mg/kg	1.1	J	**8.2**		3.1		2,360		22,800		179		1.5		62.7	
HSS-E-0-101-07-251	01/31/06	08/21/07	Surface	REG	mg/kg	NA		**6.9**	J-	NA		1,280	J-	NA		68.5	J-	NA		NA	
HSS-E-0-101-07-259	01/31/06	08/21/07	Surface	REG	mg/kg	NA		**3.2**	J-	NA		538	J-	NA		31.2	J-	NA		NA	
HSS-E-0-101-07-270	02/01/06	11/27/06	Surface	REG	mg/kg	NA		**60.2**	J-	NA		**16,400**	J-	NA		394	J-	NA		NA	
HSS-E-0-101-07-284	02/01/06	08/21/07	Surface	REG	mg/kg	NA		**13.8**	J-	NA		**6,230**	J-	NA		136	J-	NA		NA	
HSS-E-0-101-07-286	02/01/06	08/21/07	Surface	REG	mg/kg	NA		**20.9**	J-	NA		**5,660**	J-	NA		216	J-	NA		NA	
HSS-E-0-101-07-301	02/01/06	02/03/06	Surface	REG	mg/kg	1.8	J	**13.7**		4.7		**8,630**		**25,100**		146		6.3		46.1	
HSS-E-0-101-07-303	02/01/06	08/21/07	Surface	REG	mg/kg	NA		**6.3**	J-	NA		761	J-	NA		25.0	J-	NA		NA	
HSS-E-0-101-07-304A	02/01/06	02/03/06	Surface	REG	mg/kg	1.9	J	**28**		5.2		**7,350**		**28,400**		146		4.2		65	
HSS-E-0-101-07-304A	02/01/06	02/03/06	Surface	FD	mg/kg	1.8	J	**25.5**		4.9		**6,070**		**29,500**		136		3.2		64.8	
HSS-E-0-101-09-004	02/07/06	11/20/06	Surface	REG	mg/kg	NA		**34.5**	J-	NA		**7,650**	J-	NA		385	J-	NA		NA	
HSS-E-0-101-09-008	02/07/06	11/20/06	Surface	REG	mg/kg	NA		**52.1**	J-	NA		**17,800**	J-	NA		**525**	J-	NA		NA	
HSS-E-0-101-09-010	02/07/06	11/20/06	Surface	REG	mg/kg	NA		**32.5**	J-	NA		**8,120**	J-	NA		349	J-	NA		NA	
HSS-E-0-101-09-014	02/06/06	08/21/07	Surface	REG	mg/kg	NA		**9.0**	J-	NA		**3,430**	J-	NA		308	J-	NA		NA	
HSS-E-0-101-09-025A	02/07/06	08/21/07	Surface	REG	mg/kg	NA		**9.5**	J-	NA		2,860	J-	NA		281	J-	NA		NA	
HSS-E-0-101-09-027	02/07/06	08/21/07	Surface	REG	mg/kg	NA		**15.2**	J-	NA		**3,280**	J-	NA		244	J-	NA		NA	
HSS-E-0-101-09-032	02/07/06	11/27/06	Surface	REG	mg/kg	NA		**27.9**	J-	NA		**8,130**	J-	NA		**454**	J-	NA		NA	
HSS-E-0-101-09-033	02/06/06	11/27/06	Surface	REG	mg/kg	NA		**34.8**	J-	NA		**8,430**	J-	NA		**838**	J-	NA		NA	
HSS-E-0-101-09-036	02/09/06	11/20/06	Surface	REG	mg/kg	NA		**17.4**	J-	NA		**5,310**	J-	NA		**746**	J-	NA		NA	
HSS-E-0-101-09-036	02/09/06	11/20/06	Surface	FD	mg/kg	NA		**20.6**	J-	NA		**5,080**	J-	NA		**867**	J-	NA		NA	
HSS-E-0-101-09-038	02/09/06	02/10/06	Surface	REG	mg/kg	2.6	J	**25.2**		6.6		**12,000**		22,700		177		9.2		42.6	
HSS-E-0-101-09-039	02/10/06	02/10/06	Surface	REG	mg/kg	0.99	J	**7**		0.88		1,250		18,100		35.9		0.95	J	41.8	
HSS-E-0-101-09-042	02/09/06	08/21/07	Surface	REG	mg/kg	NA		**12.0**	J-	NA		**3,450**	J-	NA		296	J-	NA		NA	
HSS-E-0-101-09-045	02/10/06	08/21/07	Surface	REG	mg/kg	NA		**20.5**	J-	NA		**5,460**	J-	NA		114	J-	NA		NA	
HSS-E-0-101-09-047	02/09/06	08/21/07	Surface	REG	mg/kg	NA		**12.2**	J-	NA		**4,380**	J-	NA		222	J-	NA		NA	
HSS-E-0-101-09-054	02/10/06	08/21/07	Surface	REG	mg/kg	NA		**20.9**	J-	NA		**5,890**	J-	NA		**630**	J-	NA		NA	
HSS-E-0-101-09-059	02/07/06	08/21/07	Surface	REG	mg/kg	NA		**9.2**	J-	NA		**4,260**	J-	NA		55.6	J-	NA		NA	
HSS-E-0-101-09-062	02/08/06	02/10/06	Surface	REG	mg/kg	1	J	**13**		3		**3,760**		19,000		268		2.5		40.6	
HSS-E-0-101-09-064	02/08/06	11/20/06	Surface	REG	mg/kg	NA		**22.7**		NA		**6,660**		NA		126		NA		NA	
HSS-E-0-101-09-067	02/08/06	11/20/06	Surface	REG	mg/kg	NA		**29.1**	J-	NA		**4,420**	J-	NA		229	J-	NA		NA	
HSS-E-0-101-09-068	02/08/06	08/21/07	Surface	REG	mg/kg	NA		**33.1**	J-	NA		**5,740**	J-	NA		366	J-	NA		NA	
HSS-E-0-101-09-070	02/07/06	02/08/06	Surface	REG	mg/kg	5.2	J	**24.3**		**147**		**11,200**		**31,100**		**4,690**		**655**		53.4	
HSS-E-0-101-09-070	02/07/06	11/20/06	Surface	REG	mg/kg	NA		**31.1**	J-	NA		**13,400**	J-	NA		**4,860**	J-	NA		NA	
HSS-E-0-101-09-072	02/07/06	08/21/07	Surface	REG	mg/kg	NA		**29.9**	J-	NA		**5,950**	J-	NA		299	J-	NA		NA	
HSS-E-0-101-09-077	02/08/06	11/20/06	Surface	REG	mg/kg	NA		**38.4**	J-	NA		**7,380**	J-	NA		**533**	J-	NA		NA	
HSS-E-0-101-09-077	02/08/06	11/20/06	Surface	FD	mg/kg	NA		**33.8**	J-	NA		**6,500**	J-	NA		396	J-	NA		NA	

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Arizona Residential Soil Remediation Level[1] (mg/kg):						**31**		**10**		**39**		**3,100**		**--**		**400**		**390**		**78**	
EPA Region IX Preliminary Remediation Goal[2] (mg/kg):						**31**		**0.39**		**37**		**3,100**		**23,000**		**400**		**390**		**78**	
Location/	**Sample**	**Shipment**		**Sample**		**Antimony**		**Arsenic**		**Cadmium**		**Copper**		**Iron**		**Lead**		**Silver**		**Vanadium**	
Parcel ID	**Date**	**Date**	**Depth**	**Type**	**Units**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**
HSS-E-0-101-09-083	02/10/06	08/21/07	Surface	REG	mg/kg	NA		**11.1**	J-	NA		2,350	J-	NA		243	J-	NA		NA	
HSS-E-0-101-09-084	02/10/06	11/20/06	Surface	REG	mg/kg	NA		**26.9**		NA		**6,550**		NA		**626**	J	NA		NA	
HSS-E-0-101-09-084	02/10/06	11/20/06	Surface	FD	mg/kg	NA		**25.9**		NA		**6,210**		NA		**633**	J	NA		NA	
HSS-E-0-101-09-088	02/10/06	11/20/06	Surface	REG	mg/kg	NA		**20.9**		NA		**4,060**		NA		**704**	J	NA		NA	
HSS-E-0-101-09-104	02/08/06	11/20/06	Surface	REG	mg/kg	NA		**53.4**	J-	NA		**19,700**	J-	NA		**639**	J-	NA		NA	
HSS-E-0-101-09-106	02/08/06	11/20/06	Surface	REG	mg/kg	NA		**47.3**	J-	NA		**11,400**	J-	NA		**499**	J-	NA		NA	
HSS-E-0-101-09-107	02/08/06	11/20/06	Surface	REG	mg/kg	NA		**37.9**		NA		**8,630**		NA		**566**		NA		NA	
HSS-E-0-101-09-108	02/08/06	11/27/06	Surface	REG	mg/kg	NA		**46.4**	J-	NA		**6,740**	J-	NA		398	J-	NA		NA	
HSS-E-0-101-09-109	02/09/06	11/20/06	Surface	REG	mg/kg	NA		**42.6**	J-	NA		**15,200**	J-	NA		117	J-	NA		NA	
HSS-E-0-101-09-111B	02/09/06	11/20/06	Surface	REG	mg/kg	NA		**34**	J-	NA		**6,310**	J-	NA		198	J-	NA		NA	
HSS-E-0-101-09-115	02/09/06	11/20/06	Surface	REG	mg/kg	NA		**24**	J-	NA		**8,110**	J-	NA		263	J-	NA		NA	
HSS-E-0-101-09-120	02/09/06	11/20/06	Surface	REG	mg/kg	NA		**23.7**	J-	NA		**4,710**	J-	NA		103	J-	NA		NA	
HSS-E-0-101-09-134	02/10/06	08/21/07	Surface	REG	mg/kg	NA		**7.3**	J-	NA		1,290	J-	NA		44.4	J-	NA		NA	
HSS-E-0-101-09-137	02/08/06	08/22/07	Surface	REG	mg/kg	NA		**30.9**	J	NA		750		NA		30.9	J	NA		NA	
HSS-E-0-101-09-140	02/08/06	08/22/07	Surface	REG	mg/kg	NA		**94.3**	J-	NA		**24,800**	J-	NA		**491**	J-	NA		NA	
HSS-E-1-101-07-010	02/09/06	11/20/06	Subsurface	REG	mg/kg	NA		**74**	J-	NA		**11,200**	J-	NA		**475**	J-	NA		NA	
HSS-E-1-101-07-030	02/06/06	11/20/06	Subsurface	REG	mg/kg	NA		**28.1**	J-	NA		**8,760**	J-	NA		316	J-	NA		NA	
HSS-E-1-101-07-030	02/06/06	11/20/06	Subsurface	FD	mg/kg	NA		**25.9**	J-	NA		**8,260**	J-	NA		286	J-	NA		NA	
HSS-E-1-101-07-037	02/03/06	11/20/06	Subsurface	REG	mg/kg	NA		**15.2**	J-	NA		**5,620**	J-	NA		358	J-	NA		NA	
HSS-E-1-101-07-042	02/03/06	08/21/07	Subsurface	REG	mg/kg	NA		**18.5**	J-	NA		2,570	J-	NA		323	J-	NA		NA	
HSS-E-1-101-07-050A	02/03/06	08/21/07	Subsurface	REG	mg/kg	NA		**15.3**	J-	NA		2,800	J-	NA		292	J-	NA		NA	
HSS-E-1-101-07-065	02/06/06	08/22/07	Subsurface	REG	mg/kg	NA		**6.3**	J-	NA		577	J-	NA		178	J-	NA		NA	
HSS-E-1-101-07-111	02/01/06	08/21/07	Subsurface	REG	mg/kg	NA		**6.9**	J	NA		**3,320**		NA		130		NA		NA	
HSS-E-1-101-07-142A	01/31/06	08/21/07	Subsurface	REG	mg/kg	NA		**6.8**	J-	NA		564	J-	NA		23.6	J-	NA		NA	
HSS-E-1-101-07-149	01/31/06	08/22/07	Subsurface	REG	mg/kg	NA		**9.6**	J-	NA		1,960	J-	NA		274	J-	NA		NA	
HSS-E-1-101-07-219	01/31/06	08/21/07	Subsurface	REG	mg/kg	NA		**11.6**	J-	NA		639	J-	NA		55.1	J-	NA		NA	
HSS-E-1-101-07-247	01/31/06	08/21/07	Subsurface	REG	mg/kg	NA		**1.1**	J-	NA		419	J-	NA		25.4	J-	NA		NA	
HSS-E-1-101-09-039	02/10/06	08/21/07	Subsurface	REG	mg/kg	NA		**2.1**	J-	NA		252	J-	NA		10.7	J-	NA		NA	
HSS-E-1-101-09-067	02/08/06	11/20/06	Subsurface	REG	mg/kg	NA		**4**	J-	NA		118	J-	NA		6.2	J-	NA		NA	
HSS-E-1-101-09-134	02/10/06	08/21/07	Subsurface	REG	mg/kg	NA		**5.0**	J-	NA		273	J-	NA		13.3	J-	NA		NA	
HSS-F-0-101-07-008	02/09/06	11/20/06	Surface	REG	mg/kg	NA		**50.2**	J-	NA		**12,100**	J-	NA		**810**	J-	NA		NA	
HSS-F-0-101-07-010	02/09/06	11/20/06	Surface	REG	mg/kg	NA		**30.6**	J-	NA		**11,500**	J-	NA		110	J-	NA		NA	
HSS-F-0-101-07-014	02/03/06	11/27/06	Surface	REG	mg/kg	NA		**17.8**	J-	NA		**8,620**	J-	NA		275	J-	NA		NA	
HSS-F-0-101-07-018	02/06/06	11/27/06	Surface	REG	mg/kg	NA		**45.1**	J-	NA		**6,380**	J-	NA		**942**	J-	NA		NA	
HSS-F-0-101-07-027	02/06/06	08/21/07	Surface	REG	mg/kg	NA		**14.4**	J-	NA		**4,520**	J-	NA		123	J-	NA		NA	
HSS-F-0-101-07-028	02/06/06	11/20/06	Surface	REG	mg/kg	NA		**29.6**	J-	NA		**6,440**	J-	NA		184	J-	NA		NA	

TABLE 4-9
Soil Sampling Laboratory Value Exceedances for Full Inorganic Target Analyte List
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Arizona Residential Soil Remediation Level[1] (mg/kg):						**31**		**10**		**39**		**3,100**		**--**		**400**		**390**		**78**	
EPA Region IX Preliminary Remediation Goal[2] (mg/kg):						**31**		**0.39**		**37**		**3,100**		**23,000**		**400**		**390**		**78**	
Location/	**Sample**	**Shipment**		**Sample**		**Antimony**		**Arsenic**		**Cadmium**		**Copper**		**Iron**		**Lead**		**Silver**		**Vanadium**	
Parcel ID	**Date**	**Date**	**Depth**	**Type**	**Units**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**
HSS-F-0-101-07-029	02/06/06	11/20/06	Surface	REG	mg/kg	NA		**35.4**	J-	NA		**7,360**	J-	NA		217	J-	NA		NA	
HSS-F-0-101-07-030	02/06/06	11/20/06	Surface	REG	mg/kg	NA		**8.2**	J-	NA		1,560	J-	NA		51	J-	NA		NA	
HSS-F-0-101-07-034	02/09/06	02/10/06	Surface	REG	mg/kg	5.7	J	**95.6**		21.5		**32,700**		**31,100**		**647**		21.3		39	
HSS-F-0-101-07-034	02/09/06	11/20/06	Surface	REG	mg/kg	NA		**123**	J-	NA		**28,300**	J-	NA		**788**	J-	NA		NA	
HSS-F-0-101-07-035AE	02/09/06	08/21/07	Surface	REG	mg/kg	NA		**5.2**	J-	NA		1,710	J-	NA		25.8	J-	NA		NA	
HSS-F-0-101-07-035AN	02/09/06	11/20/06	Surface	REG	mg/kg	NA		**12.8**	J-	NA		**7,220**	J-	NA		38.4	J-	NA		NA	
HSS-F-0-101-07-035AS	02/09/06	11/20/06	Surface	REG	mg/kg	NA		**25**	J-	NA		**6,660**	J-	NA		285	J-	NA		NA	
HSS-F-0-101-07-037	02/03/06	11/20/06	Surface	REG	mg/kg	NA		**40.4**	J-	NA		**11,600**	J-	NA		224	J-	NA		NA	
HSS-F-0-101-07-040	02/03/06	11/20/06	Surface	REG	mg/kg	NA		**8.3**	J-	NA		2,670	J-	NA		56.9	J-	NA		NA	
HSS-F-0-101-07-040	02/03/06	09/14/07	Surface	REG	mg/kg	NA		**11.3**	J-	NA		**3,330**	J-	NA		69.0	J-	NA		NA	
HSS-F-0-101-07-041	02/03/06	02/03/06	Surface	REG	mg/kg	1.2	J	**14.6**		2		**3,210**		19,900		173		2.2		40.4	
HSS-F-0-101-07-042	02/03/06	08/21/07	Surface	REG	mg/kg	NA		**20.3**	J-	NA		**6,540**	J-	NA		327	J-	NA		NA	
HSS-F-0-101-07-046	02/06/06	08/21/07	Surface	REG	mg/kg	NA		**21.5**	J-	NA		2,620	J-	NA		226	J-	NA		NA	
HSS-F-0-101-07-046	02/06/06	08/21/07	Surface	FD	mg/kg	NA		**23.4**	J-	NA		2,680	J-	NA		224	J-	NA		NA	
HSS-F-0-101-07-047	02/06/06	02/08/06	Surface	REG	mg/kg	2.4	J	**24.9**		6.1		**6,920**		**27,400**		383		5		40.1	
HSS-F-0-101-07-050A	02/03/06	08/21/07	Surface	REG	mg/kg	NA		**13.4**	J-	NA		**3,650**	J-	NA		93.7	J-	NA		NA	
HSS-F-0-101-07-052	02/02/06	11/20/06	Surface	REG	mg/kg	NA		**33.7**	J-	NA		**10,400**	J-	NA		250	J-	NA		NA	
HSS-F-0-101-07-060	02/02/06	08/21/07	Surface	REG	mg/kg	NA		**18.2**	J-	NA		**5,530**	J-	NA		**1,010**	J-	NA		NA	
HSS-F-0-101-07-061	02/02/06	08/21/07	Surface	REG	mg/kg	NA		**9.3**	J-	NA		**3,460**	J-	NA		49.3	J-	NA		NA	
HSS-F-0-101-07-062	02/02/06	02/03/06	Surface	REG	mg/kg	3.1	J	**42.6**		8.7		**11,200**		**78,300**		208		8		50.3	
HSS-F-0-101-07-062	02/02/06	11/27/06	Surface	REG	mg/kg	NA		**58.5**	J-	NA		**11,500**	J-	NA		268	J-	NA		NA	
HSS-F-0-101-07-065	02/06/06	08/22/07	Surface	REG	mg/kg	NA		**18.7**	J-	NA		1,890	J-	NA		257	J-	NA		NA	
HSS-F-0-101-07-066	02/06/06	08/21/07	Surface	REG	mg/kg	NA		**6.6**	J-	NA		1,520	J-	NA		50.2	J-	NA		NA	
HSS-F-0-101-07-066	02/06/06	08/21/07	Surface	FD	mg/kg	NA		**6.7**	J-	NA		1,880	J-	NA		54.4	J-	NA		NA	
HSS-F-0-101-07-082	02/06/06	08/21/07	Surface	REG	mg/kg	NA		**30.7**	J-	NA		**4,670**	J-	NA		355	J-	NA		NA	
HSS-F-0-101-07-089K	02/07/06	02/08/06	Surface	REG	mg/kg	2.3	J	**60.6**		7.8		**11,300**		**23,400**		171		15		49.6	
HSS-F-0-101-07-089K	02/07/06	11/20/06	Surface	REG	mg/kg	NA		**81.1**	J-	NA		**12,000**	J-	NA		200	J-	NA		NA	
HSS-F-0-101-07-089Q	02/02/06	08/22/07	Surface	REG	mg/kg	NA		**10.1**	J	NA		**5,400**		NA		51.5	J	NA		NA	
HSS-F-0-101-07-089Q	02/02/06	08/22/07	Surface	FD	mg/kg	NA		**23.7**	J	NA		**45,900**		NA		65.4	J	NA		NA	
HSS-F-0-101-07-089S	02/07/06	11/20/06	Surface	REG	mg/kg	NA		**40**	J-	NA		**6,830**	J-	NA		105	J-	NA		NA	
HSS-F-0-101-07-089T	02/07/06	11/27/06	Surface	REG	mg/kg	NA		**60.6**		NA		**4,300**		NA		90.2	J	NA		NA	
HSS-F-0-101-07-089T	02/07/06	11/27/06	Surface	FD	mg/kg	NA		**67.8**	J-	NA		**5,360**	J-	NA		102	J-	NA		NA	
HSS-F-0-101-07-089U	02/07/06	11/20/06	Surface	REG	mg/kg	NA		**43.7**	J-	NA		**16,100**	J-	NA		125	J-	NA		NA	
HSS-F-0-101-07-090	02/02/06	11/20/06	Surface	REG	mg/kg	NA		**14.9**	J-	NA		**7,200**	J-	NA		38.8	J-	NA		NA	
HSS-F-0-101-07-091	02/02/06	11/20/06	Surface	REG	mg/kg	NA		**3.6**	J-	NA		1,330	J-	NA		31.4	J-	NA		NA	
HSS-F-0-101-07-092A	02/02/06	08/21/07	Surface	REG	mg/kg	NA		**30.9**	J-	NA		**10,100**	J-	NA		252	J-	NA		NA	

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Arizona Residential Soil Remediation Level[1] (mg/kg):						**31**		**10**		**39**		**3,100**		**--**		**400**		**390**		**78**	
EPA Region IX Preliminary Remediation Goal[2] (mg/kg):						**31**		**0.39**		**37**		**3,100**		**23,000**		**400**		**390**		**78**	
Location/	**Sample**	**Shipment**		**Sample**		**Antimony**		**Arsenic**		**Cadmium**		**Copper**		**Iron**		**Lead**		**Silver**		**Vanadium**	
Parcel ID	**Date**	**Date**	**Depth**	**Type**	**Units**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**
HSS-F-0-101-07-099	02/01/06	11/20/06	Surface	REG	mg/kg	NA		**41.6**	J-	NA		**10,100**	J-	NA		169	J-	NA		NA	
HSS-F-0-101-07-099	02/01/06	11/20/06	Surface	FD	mg/kg	NA		**36.1**	J-	NA		**9,100**	J-	NA		151	J-	NA		NA	
HSS-F-0-101-07-104	02/01/06	08/21/07	Surface	REG	mg/kg	NA		**11.4**	J-	NA		1,760	J-	NA		37.0	J-	NA		NA	
HSS-F-0-101-07-105	02/02/06	11/20/06	Surface	REG	mg/kg	NA		**30.4**	J-	NA		**8,590**	J-	NA		**1,740**	J-	NA		NA	
HSS-F-0-101-07-110	02/02/06	08/21/07	Surface	REG	mg/kg	NA		**9.2**	J-	NA		**3,480**	J-	NA		32.1	J-	NA		NA	
HSS-F-0-101-07-111	02/01/06	08/21/07	Surface	REG	mg/kg	NA		**4.9**	J	NA		2,820		NA		30.1		NA		NA	
HSS-F-0-101-07-117	02/01/06	11/27/06	Surface	REG	mg/kg	NA		**41**	J-	NA		**13,100**	J-	NA		342	J-	NA		NA	
HSS-F-0-101-07-129	02/01/06	08/21/07	Surface	REG	mg/kg	NA		**18.8**	J	NA		**6,520**		NA		187		NA		NA	
HSS-F-0-101-07-142A	01/31/06	08/21/07	Surface	REG	mg/kg	NA		**16.2**	J-	NA		2,820	J-	NA		117	J-	NA		NA	
HSS-F-0-101-07-149	01/31/06	08/22/07	Surface	REG	mg/kg	NA		**11.3**	J-	NA		1,860	J-	NA		55.6	J-	NA		NA	
HSS-F-0-101-07-176	01/31/06	11/20/06	Surface	REG	mg/kg	NA		**9.8**	J-	NA		1,250	J-	NA		45.5	J-	NA		NA	
HSS-F-0-101-07-185C	01/31/06	08/22/07	Surface	REG	mg/kg	NA		**9.8**	J-	NA		1,920	J-	NA		56.5	J-	NA		NA	
HSS-F-0-101-07-193A	01/31/06	08/22/07	Surface	REG	mg/kg	NA		**14.6**	J-	NA		1,590	J-	NA		111	J-	NA		NA	
HSS-F-0-101-07-202	01/31/06	02/02/06	Surface	REG	mg/kg	0.58	J	**3.9**		0.38	UJ	364		15,200		15.3		0.15	J	34.6	
HSS-F-0-101-07-216	01/30/06	08/21/07	Surface	REG	mg/kg	NA		**11.7**	J-	NA		2,410	J-	NA		185	J-	NA		NA	
HSS-F-0-101-07-219	01/31/06	08/21/07	Surface	REG	mg/kg	NA		**20.0**	J-	NA		**3,320**	J-	NA		138	J-	NA		NA	
HSS-F-0-101-07-234	02/01/06	08/21/07	Surface	REG	mg/kg	NA		**5.5**	J-	NA		1,820	J-	NA		26.3	J-	NA		NA	
HSS-F-0-101-07-236	02/01/06	08/21/07	Surface	REG	mg/kg	NA		**50.6**	J-	NA		**7,900**	J-	NA		381	J-	NA		NA	
HSS-F-0-101-07-242	01/31/06	08/21/07	Surface	REG	mg/kg	NA		**13.4**	J-	NA		2,470	J-	NA		168	J-	NA		NA	
HSS-F-0-101-07-244	02/01/06	08/21/07	Surface	REG	mg/kg	NA		**13.8**	J-	NA		**4,270**	J-	NA		193	J-	NA		NA	
HSS-F-0-101-07-247	01/31/06	08/21/07	Surface	REG	mg/kg	NA		**5.5**	J-	NA		1,050	J-	NA		70.0	J-	NA		NA	
HSS-F-0-101-07-251	01/31/06	08/21/07	Surface	REG	mg/kg	NA		**5.5**	J-	NA		1,410	J-	NA		122	J-	NA		NA	
HSS-F-0-101-07-259	01/31/06	08/21/07	Surface	REG	mg/kg	NA		**15.2**	J-	NA		**3,890**	J-	NA		167	J-	NA		NA	
HSS-F-0-101-07-270	02/01/06	11/27/06	Surface	REG	mg/kg	NA		**38.9**	J-	NA		**15,200**	J-	NA		**691**	J-	NA		NA	
HSS-F-0-101-07-284	02/01/06	08/21/07	Surface	REG	mg/kg	NA		**15.0**	J-	NA		**5,790**	J-	NA		122	J-	NA		NA	
HSS-F-0-101-07-286	02/01/06	08/21/07	Surface	REG	mg/kg	NA		**17.2**	J-	NA		**7,140**	J-	NA		189	J-	NA		NA	
HSS-F-0-101-07-301	02/01/06	08/21/07	Surface	REG	mg/kg	NA		**19.3**	J-	NA		**7,450**	J-	NA		138	J-	NA		NA	
HSS-F-0-101-07-303	02/01/06	02/03/06	Surface	REG	mg/kg	0.78	J	**8.7**		1.8		2,480		16,400		67.5		1.8		34.6	
HSS-F-0-101-07-303	02/01/06	02/03/06	Surface	FD	mg/kg	0.94	J	**9.4**		2.1		2,630		17,800		76.9		2		37.9	
HSS-F-0-101-07-304A	02/01/06	08/21/07	Surface	REG	mg/kg	NA		**12.7**	J-	NA		2,360	J-	NA		91.1	J-	NA		NA	
HSS-F-0-101-09-004	02/07/06	11/20/06	Surface	REG	mg/kg	NA		**11**	J-	NA		2,490	J-	NA		**488**	J-	NA		NA	
HSS-F-0-101-09-008	02/07/06	11/20/06	Surface	REG	mg/kg	NA		**46.7**	J-	NA		**7,980**	J-	NA		273	J-	NA		NA	
HSS-F-0-101-09-010	02/07/06	11/20/06	Surface	REG	mg/kg	NA		**17.7**	J-	NA		**4,270**	J-	NA		245	J-	NA		NA	
HSS-F-0-101-09-010	02/07/06	11/20/06	Surface	FD	mg/kg	NA		**18.9**	J-	NA		**4,380**	J-	NA		245	J-	NA		NA	
HSS-F-0-101-09-014	02/06/06	08/21/07	Surface	REG	mg/kg	NA		**13.3**	J-	NA		2,620	J-	NA		145	J-	NA		NA	
HSS-F-0-101-09-025A	02/07/06	08/21/07	Surface	REG	mg/kg	NA		**12.9**	J-	NA		**3,530**	J-	NA		140	J-	NA		NA	

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Arizona Residential Soil Remediation Level[1] (mg/kg):						**31**		**10**		**39**		**3,100**		**--**		**400**		**390**		**78**	
EPA Region IX Preliminary Remediation Goal[2] (mg/kg):						**31**		**0.39**		**37**		**3,100**		**23,000**		**400**		**390**		**78**	
Location/	**Sample**	**Shipment**		**Sample**		**Antimony**		**Arsenic**		**Cadmium**		**Copper**		**Iron**		**Lead**		**Silver**		**Vanadium**	
Parcel ID	**Date**	**Date**	**Depth**	**Type**	**Units**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**
HSS-F-0-101-09-027	02/07/06	08/21/07	Surface	REG	mg/kg	NA		**24.7**	J-	NA		**6,840**	J-	NA		352	J-	NA		NA	
HSS-F-0-101-09-032	02/07/06	02/08/06	Surface	REG	mg/kg	1.4	J	**14.2**		5		**8,200**		21,600		243		6.3		40.2	
HSS-F-0-101-09-032	02/07/06	11/27/06	Surface	REG	mg/kg	NA		**23**	J-	NA		**8,480**	J-	NA		291	J-	NA		NA	
HSS-F-0-101-09-033	02/06/06	11/27/06	Surface	REG	mg/kg	NA		**24**	J-	NA		**4,710**	J-	NA		266	J-	NA		NA	
HSS-F-0-101-09-036	02/09/06	02/10/06	Surface	REG	mg/kg	3.1	J	**24.1**		5.7		**8,850**		**24,500**		321		8.2		49.2	
HSS-F-0-101-09-036	02/09/06	11/20/06	Surface	REG	mg/kg	NA		**34.3**	J-	NA		**9,680**	J-	NA		382	J-	NA		NA	
HSS-F-0-101-09-038	02/09/06	11/20/06	Surface	REG	mg/kg	NA		**11.7**	J-	NA		856	J-	NA		30.2	J-	NA		NA	
HSS-F-0-101-09-039	02/10/06	08/21/07	Surface	REG	mg/kg	NA		**16.2**	J-	NA		**5,250**	J-	NA		287	J-	NA		NA	
HSS-F-0-101-09-042	02/09/06	08/21/07	Surface	REG	mg/kg	NA		**11.0**	J-	NA		**3,320**	J-	NA		**427**	J-	NA		NA	
HSS-F-0-101-09-045	02/10/06	08/21/07	Surface	REG	mg/kg	NA		**25.9**	J-	NA		**5,120**	J-	NA		192	J-	NA		NA	
HSS-F-0-101-09-047	02/09/06	08/21/07	Surface	REG	mg/kg	NA		**14.5**	J-	NA		**3,170**	J-	NA		**1,110**	J-	NA		NA	
HSS-F-0-101-09-054	02/10/06	02/10/06	Surface	REG	mg/kg	1.5	J	**15.8**		3.7		**4,110**		**26,900**		**746**		2.2		52.8	
HSS-F-0-101-09-059	02/07/06	08/21/07	Surface	REG	mg/kg	NA		**15.9**	J-	NA		**4,610**	J-	NA		**1,350**	J-	NA		NA	
HSS-F-0-101-09-062	02/08/06	08/21/07	Surface	REG	mg/kg	NA		**18.2**	J-	NA		**3,310**	J-	NA		**582**	J-	NA		NA	
HSS-F-0-101-09-064	02/08/06	11/20/06	Surface	REG	mg/kg	NA		**41.9**	J-	NA		**8,340**	J-	NA		**434**	J-	NA		NA	
HSS-F-0-101-09-064	02/08/06	11/20/06	Surface	FD	mg/kg	NA		**40.4**	J-	NA		**9,240**	J-	NA		**413**	J-	NA		NA	
HSS-F-0-101-09-067	02/08/06	11/20/06	Surface	REG	mg/kg	NA		**44.8**	J-	NA		**5,880**	J-	NA		356	J-	NA		NA	
HSS-F-0-101-09-068	02/08/06	08/21/07	Surface	REG	mg/kg	NA		**16.9**	J-	NA		**3,520**	J-	NA		111	J-	NA		NA	
HSS-F-0-101-09-070	02/07/06	11/20/06	Surface	REG	mg/kg	NA		**21.1**	J-	NA		**7,190**	J-	NA		232	J-	NA		NA	
HSS-F-0-101-09-072	02/07/06	08/21/07	Surface	REG	mg/kg	NA		**17.3**	J-	NA		**4,560**	J-	NA		145	J-	NA		NA	
HSS-F-0-101-09-077	02/08/06	11/20/06	Surface	REG	mg/kg	NA		**23.6**	J-	NA		**4,440**	J-	NA		**516**	J-	NA		NA	
HSS-F-0-101-09-083	02/10/06	08/21/07	Surface	REG	mg/kg	NA		**69.5**	J-	NA		**11,900**	J-	NA		242	J-	NA		NA	
HSS-F-0-101-09-084	02/10/06	11/20/06	Surface	REG	mg/kg	NA		**35**		NA		**7,710**		NA		**1,100**	J	NA		NA	
HSS-F-0-101-09-088	02/10/06	11/20/06	Surface	REG	mg/kg	NA		**10.9**		NA		2,220		NA		196	J	NA		NA	
HSS-F-0-101-09-104	02/08/06	11/20/06	Surface	REG	mg/kg	NA		**33.2**	J-	NA		**8,980**	J-	NA		311	J-	NA		NA	
HSS-F-0-101-09-106	02/08/06	11/20/06	Surface	REG	mg/kg	NA		**26.2**	J-	NA		**8,960**	J-	NA		282	J-	NA		NA	
HSS-F-0-101-09-107	02/08/06	11/20/06	Surface	REG	mg/kg	NA		**41.3**		NA		**5,480**		NA		**841**		NA		NA	
HSS-F-0-101-09-108	02/08/06	11/20/06	Surface	REG	mg/kg	NA		**58.7**		NA		**19,700**		NA		314		NA		NA	
HSS-F-0-101-09-109	02/09/06	11/20/06	Surface	REG	mg/kg	NA		**22.2**	J-	NA		**5,250**	J-	NA		**817**	J-	NA		NA	
HSS-F-0-101-09-111B	02/09/06	02/10/06	Surface	REG	mg/kg	1.5	J	**55.7**		11.1		**14,300**		**31,900**		284		13.7		74.6	
HSS-F-0-101-09-111B	02/09/06	11/20/06	Surface	REG	mg/kg	NA		**79.9**	J-	NA		**18,200**	J-	NA		337	J-	NA		NA	
HSS-F-0-101-09-111B	02/09/06	09/14/07	Surface	REG	mg/kg	NA		**75.0**	J-	NA		**17,200**	J-	NA		293	J-	NA		NA	
HSS-F-0-101-09-115	02/09/06	11/20/06	Surface	REG	mg/kg	NA		**27.7**	J-	NA		**4,790**	J-	NA		180	J-	NA		NA	
HSS-F-0-101-09-120	02/09/06	11/20/06	Surface	REG	mg/kg	NA		**42.4**	J-	NA		**9,980**	J-	NA		319	J-	NA		NA	
HSS-F-0-101-09-134	02/10/06	08/21/07	Surface	REG	mg/kg	NA		**14.2**	J-	NA		2,480	J-	NA		60.5	J-	NA		NA	
HSS-F-0-101-09-137	02/08/06	08/22/07	Surface	REG	mg/kg	NA		**25.9**	J	NA		**5,390**		NA		91.2	J	NA		NA	

TABLE 4-9
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Hayden Residential Properties
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ASARCO LLC Hayden, Arizona Plant Site

The data in this table are illustrated on figures 4-5, 4-13, 4-15, 4-17, 4-63, 4-64, 4-65, 4-66, 4-67, 4-68, and 4-69.

Arizona Residential Soil Remediation Level[1] (mg/kg):						**31**		**10**		**39**		**3,100**		**--**		**400**		**390**		**78**	
EPA Region IX Preliminary Remediation Goal[2] (mg/kg):						**31**		**0.39**		**37**		**3,100**		**23,000**		**400**		**390**		**78**	
Location/	**Sample**	**Shipment**		**Sample**		**Antimony**		**Arsenic**		**Cadmium**		**Copper**		**Iron**		**Lead**		**Silver**		**Vanadium**	
Parcel ID	**Date**	**Date**	**Depth**	**Type**	**Units**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**
HSS-F-0-101-09-140	02/08/06	02/10/06	Surface	REG	mg/kg	1.3	J	**26.2**		6.7		**8,280**		**23,700**		193		6.1		50	
HSS-F-1-101-07-027	02/06/06	08/21/07	Subsurface	REG	mg/kg	NA		**6.2**	J-	NA		852	J-	NA		40.7	J-	NA		NA	
HSS-F-1-101-07-047	02/06/06	11/27/06	Subsurface	REG	mg/kg	NA		**11.5**		NA		816		NA		60.7	J	NA		NA	
HSS-F-1-101-07-089K	02/07/06	11/20/06	Subsurface	REG	mg/kg	NA		**9.9**	J-	NA		802	J-	NA		10.8	J-	NA		NA	
HSS-F-1-101-07-089S	02/07/06	11/20/06	Subsurface	REG	mg/kg	NA		**8.2**	J-	NA		931	J-	NA		19.5	J-	NA		NA	
HSS-F-1-101-07-090	02/02/06	11/20/06	Subsurface	REG	mg/kg	NA		**15.2**	J-	NA		**6,380**	J-	NA		57.7	J-	NA		NA	
HSS-F-1-101-07-090	02/02/06	11/20/06	Subsurface	FD	mg/kg	NA		**16.1**	J-	NA		**7,440**	J-	NA		39	J-	NA		NA	
HSS-F-1-101-07-236	02/01/06	08/21/07	Subsurface	REG	mg/kg	NA		**5.9**	J-	NA		588	J-	NA		62.1	J-	NA		NA	
HSS-F-1-101-09-014	02/06/06	08/21/07	Subsurface	REG	mg/kg	NA		**4.5**	J-	NA		965	J-	NA		20.1	J-	NA		NA	
HSS-F-1-101-09-033	02/06/06	11/27/06	Subsurface	REG	mg/kg	NA		**9.2**	J-	NA		1,730	J-	NA		167	J-	NA		NA	
HSS-F-1-101-09-083	02/10/06	08/21/07	Subsurface	REG	mg/kg	NA		**11.3**	J-	NA		1,380	J-	NA		186	J-	NA		NA	
HSS-F-1-101-09-106	02/08/06	11/20/06	Subsurface	REG	mg/kg	NA		**6.4**	J-	NA		1,530	J-	NA		162	J-	NA		NA	
HSS-G-0-101-07-008	02/09/06	11/20/06	Surface	REG	mg/kg	NA		**40.9**	J-	NA		**12,200**	J-	NA		285	J-	NA		NA	
HSS-G-0-101-07-010	02/09/06	11/20/06	Surface	REG	mg/kg	NA		**27.1**	J-	NA		**8,900**	J-	NA		107	J-	NA		NA	
HSS-G-0-101-07-010	02/09/06	11/20/06	Surface	FD	mg/kg	NA		**21.8**	J-	NA		**6,570**	J-	NA		87.5	J-	NA		NA	
HSS-G-0-101-07-014	02/03/06	11/27/06	Surface	REG	mg/kg	NA		**10.1**	J-	NA		2,650	J-	NA		288	J-	NA		NA	
HSS-G-0-101-07-018	02/06/06	02/08/06	Surface	REG	mg/kg	1.9	J	**18.1**		3.7		**6,200**		22,100		352		5.7		41.6	
HSS-G-0-101-07-027	02/06/06	08/21/07	Surface	REG	mg/kg	NA		**27.6**	J-	NA		**6,630**	J-	NA		166	J-	NA		NA	
HSS-G-0-101-07-028	02/06/06	11/20/06	Surface	REG	mg/kg	NA		**56.5**	J-	NA		**15,800**	J-	NA		**1,180**	J-	NA		NA	
HSS-G-0-101-07-029	02/06/06	11/20/06	Surface	REG	mg/kg	NA		**60.6**	J-	NA		**9,980**	J-	NA		**483**	J-	NA		NA	
HSS-G-0-101-07-029	02/06/06	11/20/06	Surface	FD	mg/kg	NA		**62.1**	J-	NA		**10,100**	J-	NA		**501**	J-	NA		NA	
HSS-G-0-101-07-030	02/06/06	11/20/06	Surface	REG	mg/kg	NA		**9.3**	J-	NA		**3,710**	J-	NA		80.1	J-	NA		NA	
HSS-G-0-101-07-034	02/09/06	11/20/06	Surface	REG	mg/kg	NA		**25.7**	J-	NA		**6,430**	J-	NA		132	J-	NA		NA	
HSS-G-0-101-07-035AE	02/09/06	08/21/07	Surface	REG	mg/kg	NA		**36.0**	J-	NA		**16,900**	J-	NA		376	J-	NA		NA	
HSS-G-0-101-07-035AN	02/09/06	11/20/06	Surface	REG	mg/kg	NA		**20.1**	J-	NA		**8,540**	J-	NA		142	J-	NA		NA	
HSS-G-0-101-07-035AS	02/09/06	11/20/06	Surface	REG	mg/kg	NA		**30**	J-	NA		**9,550**	J-	NA		113	J-	NA		NA	
HSS-G-0-101-07-037	02/03/06	11/20/06	Surface	REG	mg/kg	NA		**30.5**	J-	NA		**9,380**	J-	NA		147	J-	NA		NA	
HSS-G-0-101-07-040	02/03/06	11/20/06	Surface	REG	mg/kg	NA		**50.5**	J-	NA		**14,800**	J-	NA		173	J-	NA		NA	
HSS-G-0-101-07-041	02/03/06	08/21/07	Surface	REG	mg/kg	NA		**9.8**	J-	NA		2,560	J-	NA		156	J-	NA		NA	
HSS-G-0-101-07-042	02/03/06	08/21/07	Surface	REG	mg/kg	NA		**6.5**	J-	NA		2,110	J-	NA		81.4	J-	NA		NA	
HSS-G-0-101-07-046	02/06/06	08/21/07	Surface	REG	mg/kg	NA		**35.3**	J-	NA		**6,240**	J-	NA		**571**	J-	NA		NA	
HSS-G-0-101-07-047	02/06/06	11/27/06	Surface	REG	mg/kg	NA		**31.6**		NA		**9,460**		NA		**841**	J	NA		NA	
HSS-G-0-101-07-050A	02/03/06	08/21/07	Surface	REG	mg/kg	NA		**14.7**	J-	NA		**3,980**	J-	NA		136	J-	NA		NA	
HSS-G-0-101-07-050A	02/03/06	08/21/07	Surface	FD	mg/kg	NA		**17.0**	J-	NA		**3,910**	J-	NA		156	J-	NA		NA	
HSS-G-0-101-07-052	02/02/06	11/20/06	Surface	REG	mg/kg	NA		**23.1**	J-	NA		**6,410**	J-	NA		139	J-	NA		NA	
HSS-G-0-101-07-060	02/02/06	08/21/07	Surface	REG	mg/kg	NA		**11.6**	J-	NA		**4,620**	J-	NA		125	J-	NA		NA	

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Arizona Residential Soil Remediation Level[1] (mg/kg):						**31**		**10**		**39**		**3,100**		**--**		**400**		**390**		**78**	
EPA Region IX Preliminary Remediation Goal[2] (mg/kg):						**31**		**0.39**		**37**		**3,100**		**23,000**		**400**		**390**		**78**	
Location/	**Sample**	**Shipment**		**Sample**		**Antimony**		**Arsenic**		**Cadmium**		**Copper**		**Iron**		**Lead**		**Silver**		**Vanadium**	
Parcel ID	**Date**	**Date**	**Depth**	**Type**	**Units**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**
HSS-G-0-101-07-061	02/02/06	02/03/06	Surface	REG	mg/kg	0.5	J	**4.6**		0.83		1,330		10,400		29.2		1		22.8	
HSS-G-0-101-07-062	02/02/06	11/27/06	Surface	REG	mg/kg	NA		**54.7**		NA		**13,600**		NA		253	J	NA		NA	
HSS-G-0-101-07-065	02/06/06	08/22/07	Surface	REG	mg/kg	NA		**18.1**	J-	NA		**3,910**	J-	NA		**439**	J-	NA		NA	
HSS-G-0-101-07-066	02/06/06	08/21/07	Surface	REG	mg/kg	NA		**7.8**	J-	NA		2,260	J-	NA		53.9	J-	NA		NA	
HSS-G-0-101-07-082	02/06/06	08/21/07	Surface	REG	mg/kg	NA		**13.7**	J-	NA		3,020	J-	NA		95.5	J-	NA		NA	
HSS-G-0-101-07-089K	02/07/06	11/20/06	Surface	REG	mg/kg	NA		**23.9**	J-	NA		**10,400**	J-	NA		**1,530**	J-	NA		NA	
HSS-G-0-101-07-089Q	02/02/06	08/22/07	Surface	REG	mg/kg	NA		**58.6**	J	NA		**10,600**		NA		156	J	NA		NA	
HSS-G-0-101-07-089S	02/07/06	11/20/06	Surface	REG	mg/kg	NA		**65.7**	J-	NA		**20,300**	J-	NA		226	J-	NA		NA	
HSS-G-0-101-07-089S	02/07/06	11/20/06	Surface	FD	mg/kg	NA		**62.6**	J-	NA		**19,600**	J-	NA		222	J-	NA		NA	
HSS-G-0-101-07-089T	02/07/06	02/08/06	Surface	REG	mg/kg	1.7	J	**77.9**		4.4		**5,250**		18,400		117		2.9		41.7	
HSS-G-0-101-07-089T	02/07/06	11/27/06	Surface	REG	mg/kg	NA		**98.5**	J-	NA		**6,760**	J-	NA		148	J-	NA		NA	
HSS-G-0-101-07-089U	02/07/06	11/20/06	Surface	REG	mg/kg	NA		**28.6**	J-	NA		**12,500**	J-	NA		87.2	J-	NA		NA	
HSS-G-0-101-07-090	02/02/06	11/20/06	Surface	REG	mg/kg	NA		**37.8**	J-	NA		**13,200**	J-	NA		319	J-	NA		NA	
HSS-G-0-101-07-091	02/02/06	11/20/06	Surface	REG	mg/kg	NA		**21.1**	J-	NA		**7,950**	J-	NA		194	J-	NA		NA	
HSS-G-0-101-07-092A	02/02/06	08/21/07	Surface	REG	mg/kg	NA		**15.7**	J-	NA		**5,550**	J-	NA		101	J-	NA		NA	
HSS-G-0-101-07-099	02/01/06	02/03/06	Surface	REG	mg/kg	3.4	J	**68.7**		9.6		**16,800**		**30,800**		303		9.8		51	
HSS-G-0-101-07-099	02/01/06	11/28/06	Surface	REG	mg/kg	NA		**91.9**	J-	NA		**13,700**	J-	NA		286	J-	NA		NA	
HSS-G-0-101-07-104	02/01/06	08/21/07	Surface	REG	mg/kg	NA		**25.4**	J-	NA		**8,540**	J-	NA		170	J-	NA		NA	
HSS-G-0-101-07-105	02/02/06	11/20/06	Surface	REG	mg/kg	NA		**21.9**	J-	NA		**8,540**	J-	NA		142	J-	NA		NA	
HSS-G-0-101-07-110	02/02/06	08/21/07	Surface	REG	mg/kg	NA		**3.7**	J-	NA		746	J-	NA		10.8	J-	NA		NA	
HSS-G-0-101-07-111	02/01/06	08/21/07	Surface	REG	mg/kg	NA		**3.0**	J	NA		1,220		NA		29.2		NA		NA	
HSS-G-0-101-07-117	02/01/06	02/03/06	Surface	REG	mg/kg	2.4	J	**29.1**		5.8		**7,880**		22,300		266		2.9		34.3	
HSS-G-0-101-07-117	02/01/06	11/27/06	Surface	REG	mg/kg	NA		**42.6**	J-	NA		**9,490**	J-	NA		343	J-	NA		NA	
HSS-G-0-101-07-129	02/01/06	08/21/07	Surface	REG	mg/kg	NA		**19.1**	J	NA		**3,120**		NA		242		NA		NA	
HSS-G-0-101-07-142A	01/31/06	08/21/07	Surface	REG	mg/kg	NA		**10.2**	J-	NA		1,550	J-	NA		47.5	J-	NA		NA	
HSS-G-0-101-07-149	01/31/06	08/22/07	Surface	REG	mg/kg	NA		**16.4**	J-	NA		**4,460**	J-	NA		119	J-	NA		NA	
HSS-G-0-101-07-176	01/31/06	11/20/06	Surface	REG	mg/kg	NA		**8.4**	J-	NA		1,790	J-	NA		106	J-	NA		NA	
HSS-G-0-101-07-185C	01/31/06	08/22/07	Surface	REG	mg/kg	NA		**9.5**	J-	NA		1,420	J-	NA		47.0	J-	NA		NA	
HSS-G-0-101-07-193A	01/31/06	08/22/07	Surface	REG	mg/kg	NA		**11.2**	J-	NA		1,520	J-	NA		48.4	J-	NA		NA	
HSS-G-0-101-07-202	01/31/06	08/21/07	Surface	REG	mg/kg	NA		**8.8**	J-	NA		1,330	J-	NA		61.6	J-	NA		NA	
HSS-G-0-101-07-216	01/30/06	08/21/07	Surface	REG	mg/kg	NA		**35.8**	J-	NA		2,520	J-	NA		**1,100**	J-	NA		NA	
HSS-G-0-101-07-219	01/31/06	08/21/07	Surface	REG	mg/kg	NA		**18.7**	J-	NA		**3,400**	J-	NA		212	J-	NA		NA	
HSS-G-0-101-07-234	02/01/06	08/21/07	Surface	REG	mg/kg	NA		**7.1**	J-	NA		2,500	J-	NA		52.3	J-	NA		NA	
HSS-G-0-101-07-236	02/01/06	08/21/07	Surface	REG	mg/kg	NA		**18.2**	J-	NA		**5,040**	J-	NA		163	J-	NA		NA	
HSS-G-0-101-07-242	01/31/06	08/21/07	Surface	REG	mg/kg	NA		**12.0**	J-	NA		1,010	J-	NA		50.3	J-	NA		NA	
HSS-G-0-101-07-244	02/01/06	08/21/07	Surface	REG	mg/kg	NA		**8.0**	J-	NA		1,320	J-	NA		51.2	J-	NA		NA	

TABLE 4-9
Soil Sampling Laboratory Value Exceedances for Full Inorganic Target Analyte List
Hayden Residential Properties
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Arizona Residential Soil Remediation Level[1] (mg/kg):						**31**		**10**		**39**		**3,100**		**--**		**400**		**390**		**78**	
EPA Region IX Preliminary Remediation Goal[2] (mg/kg):						**31**		**0.39**		**37**		**3,100**		**23,000**		**400**		**390**		**78**	
Location/	**Sample**	**Shipment**		**Sample**		**Antimony**		**Arsenic**		**Cadmium**		**Copper**		**Iron**		**Lead**		**Silver**		**Vanadium**	
Parcel ID	**Date**	**Date**	**Depth**	**Type**	**Units**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**
HSS-G-0-101-07-247	01/31/06	08/21/07	Surface	REG	mg/kg	NA		**6.0**	J-	NA		1,190	J-	NA		92.0	J-	NA		NA	
HSS-G-0-101-07-251	01/31/06	08/21/07	Surface	REG	mg/kg	NA		**14.9**	J-	NA		**4,370**	J-	NA		235	J-	NA		NA	
HSS-G-0-101-07-259	01/31/06	02/02/06	Surface	REG	mg/kg	0.82	J	**6.6**		1.3		2,490		19,300		41.6		2.1		31.2	
HSS-G-0-101-07-270	02/01/06	11/27/06	Surface	REG	mg/kg	NA		**64.8**	J-	NA		**17,500**	J-	NA		**1,340**	J-	NA		NA	
HSS-G-0-101-07-284	02/01/06	08/21/07	Surface	REG	mg/kg	NA		**11.0**	J-	NA		**3,390**	J-	NA		71.1	J-	NA		NA	
HSS-G-0-101-07-286	02/01/06	09/14/07	Surface	REG	mg/kg	NA		**16.4**	J-	NA		**4,760**	J-	NA		167	J-	NA		NA	
HSS-G-0-101-07-301	02/01/06	08/21/07	Surface	REG	mg/kg	NA		**22.8**	J-	NA		**10,200**	J-	NA		**941**	J-	NA		NA	
HSS-G-0-101-07-303	02/01/06	08/21/07	Surface	REG	mg/kg	NA		**9.2**	J-	NA		2,430	J-	NA		68.4	J-	NA		NA	
HSS-G-0-101-07-304A	02/01/06	08/21/07	Surface	REG	mg/kg	NA		**3.5**	J-	NA		879	J-	NA		22.2	J-	NA		NA	
HSS-G-0-101-09-004	02/07/06	02/08/06	Surface	REG	mg/kg	1.8	J	**27.8**		4.8		**4,320**		18,600		342		4		35.8	
HSS-G-0-101-09-004	02/07/06	09/14/07	Surface	REG	mg/kg	NA		**30.4**	J-	NA		**3,790**	J-	NA		331	J-	NA		NA	
HSS-G-0-101-09-008	02/07/06	11/20/06	Surface	REG	mg/kg	NA		**41**	J-	NA		**8,540**	J-	NA		262	J-	NA		NA	
HSS-G-0-101-09-010	02/07/06	11/27/06	Surface	REG	mg/kg	NA		**19.3**	J-	NA		**3,250**	J-	NA		203	J-	NA		NA	
HSS-G-0-101-09-014	02/06/06	08/21/07	Surface	REG	mg/kg	NA		**31.5**	J-	NA		**4,620**	J-	NA		262	J-	NA		NA	
HSS-G-0-101-09-025A	02/07/06	08/21/07	Surface	REG	mg/kg	NA		**15.2**	J-	NA		**3,910**	J-	NA		188	J-	NA		NA	
HSS-G-0-101-09-027	02/07/06	08/21/07	Surface	REG	mg/kg	NA		**27.3**	J-	NA		**4,370**	J-	NA		**457**	J-	NA		NA	
HSS-G-0-101-09-032	02/07/06	11/27/06	Surface	REG	mg/kg	NA		**24.3**	J-	NA		**7,210**	J-	NA		209	J-	NA		NA	
HSS-G-0-101-09-033	02/06/06	11/27/06	Surface	REG	mg/kg	NA		**29.2**	J-	NA		**5,920**	J-	NA		255	J-	NA		NA	
HSS-G-0-101-09-036	02/09/06	11/20/06	Surface	REG	mg/kg	NA		**19.6**	J-	NA		**4,390**	J-	NA		386	J-	NA		NA	
HSS-G-0-101-09-038	02/09/06	11/20/06	Surface	REG	mg/kg	NA		**21.8**	J-	NA		2,100	J-	NA		204	J-	NA		NA	
HSS-G-0-101-09-039	02/10/06	08/21/07	Surface	REG	mg/kg	NA		**6.0**	J-	NA		2,180	J-	NA		74.0	J-	NA		NA	
HSS-G-0-101-09-042	02/09/06	02/10/06	Surface	REG	mg/kg	2.2	J	**14.4**		4.1		**4,110**		20,400		274		2.6		40.8	
HSS-G-0-101-09-045	02/10/06	02/10/06	Surface	REG	mg/kg	1.2	J	**16.5**		2.2		2,700		18,800		79.2		1.9		38.8	
HSS-G-0-101-09-047	02/09/06	08/21/07	Surface	REG	mg/kg	NA		**17.9**	J-	NA		**3,440**	J-	NA		296	J-	NA		NA	
HSS-G-0-101-09-054	02/10/06	08/21/07	Surface	REG	mg/kg	NA		**27.1**	J-	NA		**8,660**	J-	NA		**480**	J-	NA		NA	
HSS-G-0-101-09-059	02/07/06	08/21/07	Surface	REG	mg/kg	NA		**6.3**	J-	NA		2,900	J-	NA		313	J-	NA		NA	
HSS-G-0-101-09-062	02/08/06	08/21/07	Surface	REG	mg/kg	NA		**31.8**	J-	NA		**5,460**	J-	NA		**576**	J-	NA		NA	
HSS-G-0-101-09-064	02/08/06	11/20/06	Surface	REG	mg/kg	NA		**22.3**	J-	NA		**4,420**	J-	NA		287	J-	NA		NA	
HSS-G-0-101-09-067	02/08/06	11/20/06	Surface	REG	mg/kg	NA		**25**	J-	NA		**5,150**	J-	NA		259	J-	NA		NA	
HSS-G-0-101-09-068	02/08/06	08/21/07	Surface	REG	mg/kg	NA		**6.8**	J-	NA		826	J-	NA		35.9	J-	NA		NA	
HSS-G-0-101-09-070	02/07/06	11/20/06	Surface	REG	mg/kg	NA		**14.6**	J-	NA		**5,390**	J-	NA		204	J-	NA		NA	
HSS-G-0-101-09-070	02/07/06	11/20/06	Surface	FD	mg/kg	NA		**15.7**	J-	NA		**5,480**	J-	NA		266	J-	NA		NA	
HSS-G-0-101-09-072	02/07/06	08/21/07	Surface	REG	mg/kg	NA		**23.5**	J-	NA		**11,800**	J-	NA		164	J-	NA		NA	
HSS-G-0-101-09-077	02/08/06	11/20/06	Surface	REG	mg/kg	NA		**56.8**	J-	NA		**8,110**	J-	NA		**1,820**	J-	NA		NA	
HSS-G-0-101-09-083	02/10/06	08/21/07	Surface	REG	mg/kg	NA		**13.0**	J-	NA		1,830	J-	NA		**536**	J-	NA		NA	
HSS-G-0-101-09-084	02/10/06	11/20/06	Surface	REG	mg/kg	NA		**19.9**		NA		**4,490**		NA		**511**	J	NA		NA	

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Arizona Residential Soil Remediation Level[1] (mg/kg):						**31**		**10**		**39**		**3,100**		**--**		**400**		**390**		**78**	
EPA Region IX Preliminary Remediation Goal[2] (mg/kg):						**31**		**0.39**		**37**		**3,100**		**23,000**		**400**		**390**		**78**	
Location/	**Sample**	**Shipment**		**Sample**		**Antimony**		**Arsenic**		**Cadmium**		**Copper**		**Iron**		**Lead**		**Silver**		**Vanadium**	
Parcel ID	**Date**	**Date**	**Depth**	**Type**	**Units**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**
HSS-G-0-101-09-088	02/10/06	11/27/06	Surface	REG	mg/kg	NA		**20.2**	J-	NA		**3,500**	J-	NA		296	J-	NA		NA	
HSS-G-0-101-09-104	02/08/06	11/20/06	Surface	REG	mg/kg	NA		**23.6**	J-	NA		**5,630**	J-	NA		143	J-	NA		NA	
HSS-G-0-101-09-106	02/08/06	11/20/06	Surface	REG	mg/kg	NA		**37.3**	J-	NA		**11,600**	J-	NA		290	J-	NA		NA	
HSS-G-0-101-09-106	02/08/06	11/20/06	Surface	FD	mg/kg	NA		**31.7**	J-	NA		**8,900**	J-	NA		211	J-	NA		NA	
HSS-G-0-101-09-107	02/08/06	11/20/06	Surface	REG	mg/kg	NA		**26.1**		NA		**6,590**		NA		144		NA		NA	
HSS-G-0-101-09-108	02/08/06	11/20/06	Surface	REG	mg/kg	NA		**51.5**		NA		**20,600**		NA		**421**		NA		NA	
HSS-G-0-101-09-109	02/09/06	11/20/06	Surface	REG	mg/kg	NA		**36.7**	J-	NA		**14,700**	J-	NA		146	J-	NA		NA	
HSS-G-0-101-09-111B	02/09/06	11/20/06	Surface	REG	mg/kg	NA		**37.9**	J-	NA		**9,780**	J-	NA		187	J-	NA		NA	
HSS-G-0-101-09-115	02/09/06	11/20/06	Surface	REG	mg/kg	NA		**41.3**	J-	NA		**8,200**	J-	NA		329	J-	NA		NA	
HSS-G-0-101-09-120	02/09/06	11/20/06	Surface	REG	mg/kg	NA		**17.6**	J-	NA		1,700	J-	NA		59.2	J-	NA		NA	
HSS-G-0-101-09-134	02/10/06	08/21/07	Surface	REG	mg/kg	NA		**11.2**	J-	NA		1,240	J-	NA		40.8	J-	NA		NA	
HSS-G-0-101-09-137	02/08/06	02/10/06	Surface	REG	mg/kg	0.88	J	**20.7**		2		2,110		17,300		53.7		2.3		32.6	
HSS-G-0-101-09-140	02/08/06	08/22/07	Surface	REG	mg/kg	NA		**43.1**	J-	NA		**8,650**	J-	NA		183	J-	NA		NA	
HSS-G-1-101-07-008	02/09/06	11/20/06	Subsurface	REG	mg/kg	NA		**24.2**	J-	NA		**7,780**	J-	NA		121	J-	NA		NA	
HSS-G-1-101-07-216	01/30/06	08/21/07	Subsurface	REG	mg/kg	NA		**4.5**	J-	NA		97.2	J-	NA		283	J-	NA		NA	
HSS-G-1-101-07-244	02/01/06	08/21/07	Subsurface	REG	mg/kg	NA		**3.3**	J-	NA		202	J-	NA		16.5	J-	NA		NA	
HSS-G-1-101-09-004	02/07/06	11/20/06	Subsurface	REG	mg/kg	NA		**15.8**	J-	NA		2,520	J-	NA		233	J-	NA		NA	
HSS-G-1-101-09-010	02/07/06	11/20/06	Subsurface	REG	mg/kg	NA		**7.8**	J-	NA		1,620	J-	NA		**501**	J-	NA		NA	
HSS-G-1-101-09-072	02/07/06	08/21/07	Subsurface	REG	mg/kg	NA		**5.7**	J-	NA		831	J-	NA		19.1	J-	NA		NA	
HSS-G-1-101-09-107	02/08/06	11/20/06	Subsurface	REG	mg/kg	NA		**9.9**		NA		**5,070**		NA		162		NA		NA	
HSS-G-1-101-09-115	02/09/06	11/20/06	Subsurface	REG	mg/kg	NA		**20.7**	J-	NA		**4,660**	J-	NA		153	J-	NA		NA	
HSS-G-1-101-09-140	02/08/06	08/22/07	Subsurface	REG	mg/kg	NA		**16.9**	J-	NA		2,190	J-	NA		53.0	J-	NA		NA	
HSS-H-0-101-07-008	02/09/06	11/27/06	Surface	REG	mg/kg	NA		**69.9**	J-	NA		**12,600**	J-	NA		248	J-	NA		NA	
HSS-H-0-101-07-010	02/09/06	11/20/06	Surface	REG	mg/kg	NA		**42.8**	J-	NA		**8,080**	J-	NA		205	J-	NA		NA	
HSS-H-0-101-07-014	02/03/06	11/27/06	Surface	REG	mg/kg	NA		**16.8**	J-	NA		**7,510**	J-	NA		379	J-	NA		NA	
HSS-H-0-101-07-018	02/06/06	11/27/06	Surface	REG	mg/kg	NA		**26.5**	J-	NA		**11,000**	J-	NA		205	J-	NA		NA	
HSS-H-0-101-07-027	02/06/06	08/21/07	Surface	REG	mg/kg	NA		**35.4**	J-	NA		**8,870**	J-	NA		237	J-	NA		NA	
HSS-H-0-101-07-028	02/06/06	11/20/06	Surface	REG	mg/kg	NA		**29.7**	J-	NA		**8,830**	J-	NA		240	J-	NA		NA	
HSS-H-0-101-07-029	02/06/06	11/20/06	Surface	REG	mg/kg	NA		**25.3**	J-	NA		**8,030**	J-	NA		282	J-	NA		NA	
HSS-H-0-101-07-030	02/06/06	11/20/06	Surface	REG	mg/kg	NA		**41.2**	J-	NA		**12,300**	J-	NA		333	J-	NA		NA	
HSS-H-0-101-07-034	02/09/06	11/20/06	Surface	REG	mg/kg	NA		**26.6**	J-	NA		**7,590**	J-	NA		178	J-	NA		NA	
HSS-H-0-101-07-035AE	02/09/06	08/21/07	Surface	REG	mg/kg	NA		**40.6**	J-	NA		**10,800**	J-	NA		129	J-	NA		NA	
HSS-H-0-101-07-035AN	02/09/06	11/20/06	Surface	REG	mg/kg	NA		**17.2**	J-	NA		**9,020**	J-	NA		108	J-	NA		NA	
HSS-H-0-101-07-035AS	02/09/06	11/20/06	Surface	REG	mg/kg	NA		**24.3**	J-	NA		**42,100**	J-	NA		181	J-	NA		NA	
HSS-H-0-101-07-037	02/03/06	11/27/06	Surface	REG	mg/kg	NA		**45.9**	J-	NA		**8,320**	J-	NA		383	J-	NA		NA	
HSS-H-0-101-07-040	02/03/06	11/20/06	Surface	REG	mg/kg	NA		**22**	J-	NA		**7,400**	J-	NA		58.9	J-	NA		NA	

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Arizona Residential Soil Remediation Level[1] (mg/kg):						**31**		**10**		**39**		**3,100**		**--**		**400**		**390**		**78**	
EPA Region IX Preliminary Remediation Goal[2] (mg/kg):						**31**		**0.39**		**37**		**3,100**		**23,000**		**400**		**390**		**78**	
Location/	**Sample**	**Shipment**		**Sample**		**Antimony**		**Arsenic**		**Cadmium**		**Copper**		**Iron**		**Lead**		**Silver**		**Vanadium**	
Parcel ID	**Date**	**Date**	**Depth**	**Type**	**Units**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**
HSS-H-0-101-07-041	02/03/06	08/21/07	Surface	REG	mg/kg	NA		**23.1**	J-	NA		**5,870**	J-	NA		202	J-	NA		NA	
HSS-H-0-101-07-042	02/03/06	08/21/07	Surface	REG	mg/kg	NA		**19.3**	J-	NA		**4,630**	J-	NA		272	J-	NA		NA	
HSS-H-0-101-07-046	02/06/06	08/21/07	Surface	REG	mg/kg	NA		**6.5**	J-	NA		1,230	J-	NA		201	J-	NA		NA	
HSS-H-0-101-07-047	02/06/06	11/27/06	Surface	REG	mg/kg	NA		**22.8**		NA		**6,550**		NA		329	J	NA		NA	
HSS-H-0-101-07-050A	02/03/06	08/21/07	Surface	REG	mg/kg	NA		**8.3**	J-	NA		**3,680**	J-	NA		72.7	J-	NA		NA	
HSS-H-0-101-07-052	02/02/06	02/03/06	Surface	REG	mg/kg	0.87	J	**8**		1.8		2,480		13,700		44.1		1.8		27.4	
HSS-H-0-101-07-060	02/02/06	08/21/07	Surface	REG	mg/kg	NA		**14.4**	J-	NA		**4,230**	J-	NA		114	J-	NA		NA	
HSS-H-0-101-07-061	02/02/06	08/21/07	Surface	REG	mg/kg	NA		**11.3**	J-	NA		**4,190**	J-	NA		51.5	J-	NA		NA	
HSS-H-0-101-07-062	02/02/06	11/27/06	Surface	REG	mg/kg	NA		**18.8**		NA		**4,750**		NA		94.1	J	NA		NA	
HSS-H-0-101-07-065	02/06/06	02/08/06	Surface	REG	mg/kg	0.99	J	**12.2**		2.5		3,050		18,300		**466**		2.6		39.1	
HSS-H-0-101-07-066	02/06/06	08/21/07	Surface	REG	mg/kg	NA		**5.3**	J-	NA		2,030	J-	NA		**3,180**	J-	NA		NA	
HSS-H-0-101-07-082	02/06/06	08/21/07	Surface	REG	mg/kg	NA		**23.1**	J-	NA		2,840	J-	NA		118	J-	NA		NA	
HSS-H-0-101-07-089K	02/07/06	11/20/06	Surface	REG	mg/kg	NA		**21.7**	J-	NA		**7,370**	J-	NA		95.1	J-	NA		NA	
HSS-H-0-101-07-089Q	02/02/06	08/22/07	Surface	REG	mg/kg	NA		**17.9**	J	NA		**8,380**		NA		45.2	J	NA		NA	
HSS-H-0-101-07-089S	02/07/06	11/20/06	Surface	REG	mg/kg	NA		**15.1**	J-	NA		**3,760**	J-	NA		47.7	J-	NA		NA	
HSS-H-0-101-07-089T	02/07/06	11/27/06	Surface	REG	mg/kg	NA		**41.3**	J-	NA		**8,050**	J-	NA		108	J-	NA		NA	
HSS-H-0-101-07-089U	02/07/06	11/20/06	Surface	REG	mg/kg	NA		**58.9**	J-	NA		**20,400**	J-	NA		157	J-	NA		NA	
HSS-H-0-101-07-090	02/02/06	11/20/06	Surface	REG	mg/kg	NA		**68.9**	J-	NA		**14,100**	J-	NA		231	J-	NA		NA	
HSS-H-0-101-07-091	02/02/06	11/20/06	Surface	REG	mg/kg	NA		**5.2**	J-	NA		1,620	J-	NA		24.1	J-	NA		NA	
HSS-H-0-101-07-092A	02/02/06	08/21/07	Surface	REG	mg/kg	NA		**35.2**	J-	NA		**7,790**	J-	NA		276	J-	NA		NA	
HSS-H-0-101-07-099	02/01/06	11/20/06	Surface	REG	mg/kg	NA		**15.7**	J-	NA		**5,220**	J-	NA		178	J-	NA		NA	
HSS-H-0-101-07-104	02/01/06	08/21/07	Surface	REG	mg/kg	NA		**23.5**	J-	NA		**5,510**	J-	NA		65.0	J-	NA		NA	
HSS-H-0-101-07-105	02/02/06	11/20/06	Surface	REG	mg/kg	NA		**22.5**	J-	NA		**8,650**	J-	NA		114	J-	NA		NA	
HSS-H-0-101-07-110	02/02/06	08/21/07	Surface	REG	mg/kg	NA		**7.9**	J-	NA		2,210	J-	NA		35.7	J-	NA		NA	
HSS-H-0-101-07-111	02/01/06	08/21/07	Surface	REG	mg/kg	NA		**11.0**	J	NA		2,200		NA		55.9		NA		NA	
HSS-H-0-101-07-117	02/01/06	11/27/06	Surface	REG	mg/kg	NA		**26.2**	J-	NA		**6,160**	J-	NA		228	J-	NA		NA	
HSS-H-0-101-07-129	02/01/06	08/21/07	Surface	REG	mg/kg	NA		**5.1**	J	NA		**3,350**		NA		71.9		NA		NA	
HSS-H-0-101-07-142A	01/31/06	08/21/07	Surface	REG	mg/kg	NA		**8.3**	J-	NA		732	J-	NA		149	J-	NA		NA	
HSS-H-0-101-07-149	01/31/06	02/02/06	Surface	REG	mg/kg	1	J	**5.4**		2		1,770		**24,100**		75.8		1.6		41.5	
HSS-H-0-101-07-176	01/31/06	11/20/06	Surface	REG	mg/kg	NA		**15.9**	J-	NA		1,440	J-	NA		52.3	J-	NA		NA	
HSS-H-0-101-07-185C	01/31/06	09/14/07	Surface	REG	mg/kg	NA		**9.0**	J-	NA		2,450	J-	NA		57.5	J-	NA		NA	
HSS-H-0-101-07-193A	01/31/06	08/22/07	Surface	REG	mg/kg	NA		**15.5**	J-	NA		2,110	J-	NA		173	J-	NA		NA	
HSS-H-0-101-07-202	01/31/06	08/21/07	Surface	REG	mg/kg	NA		**7.5**	J-	NA		1,440	J-	NA		111	J-	NA		NA	
HSS-H-0-101-07-216	01/30/06	08/21/07	Surface	REG	mg/kg	NA		**16.4**	J-	NA		2,480	J-	NA		293	J-	NA		NA	
HSS-H-0-101-07-219	01/31/06	08/21/07	Surface	REG	mg/kg	NA		**16.1**	J-	NA		**3,980**	J-	NA		133	J-	NA		NA	
HSS-H-0-101-07-234	02/01/06	08/21/07	Surface	REG	mg/kg	NA		**13.3**	J-	NA		**4,150**	J-	NA		113	J-	NA		NA	

TABLE 4-9
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Arizona Residential Soil Remediation Level[1] (mg/kg):						**31**		**10**		**39**		**3,100**		**--**		**400**		**390**		**78**	
EPA Region IX Preliminary Remediation Goal[2] (mg/kg):						**31**		**0.39**		**37**		**3,100**		**23,000**		**400**		**390**		**78**	
Location/	**Sample**	**Shipment**		**Sample**		**Antimony**		**Arsenic**		**Cadmium**		**Copper**		**Iron**		**Lead**		**Silver**		**Vanadium**	
Parcel ID	**Date**	**Date**	**Depth**	**Type**	**Units**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**
HSS-H-0-101-07-236	02/01/06	08/21/07	Surface	REG	mg/kg	NA		**18.9**	J-	NA		**4,050**	J-	NA		193	J-	NA		NA	
HSS-H-0-101-07-242	01/31/06	08/21/07	Surface	REG	mg/kg	NA		**16.2**	J-	NA		1,790	J-	NA		84.8	J-	NA		NA	
HSS-H-0-101-07-244	02/01/06	08/21/07	Surface	REG	mg/kg	NA		**7.8**	J-	NA		2,450	J-	NA		159	J-	NA		NA	
HSS-H-0-101-07-247	01/31/06	08/21/07	Surface	REG	mg/kg	NA		**11.9**	J-	NA		2,370	J-	NA		**840**	J-	NA		NA	
HSS-H-0-101-07-251	01/31/06	08/21/07	Surface	REG	mg/kg	NA		**24.2**	J-	NA		**3,620**	J-	NA		238	J-	NA		NA	
HSS-H-0-101-07-259	01/31/06	08/21/07	Surface	REG	mg/kg	NA		**3.6**	J-	NA		665	J-	NA		36.3	J-	NA		NA	
HSS-H-0-101-07-270	02/01/06	11/27/06	Surface	REG	mg/kg	NA		**10.1**	J-	NA		2,760	J-	NA		308	J-	NA		NA	
HSS-H-0-101-07-284	02/01/06	02/03/06	Surface	REG	mg/kg	1.3	J	**10.8**		3.6		**5,340**		18,400		109		3.7		31.1	
HSS-H-0-101-07-286	02/01/06	08/21/07	Surface	REG	mg/kg	NA		**23.8**	J-	NA		**8,230**	J-	NA		253	J-	NA		NA	
HSS-H-0-101-07-301	02/01/06	08/21/07	Surface	REG	mg/kg	NA		**23.4**	J-	NA		**8,170**	J-	NA		187	J-	NA		NA	
HSS-H-0-101-07-303	02/01/06	08/21/07	Surface	REG	mg/kg	NA		**13.1**	J-	NA		1,790	J-	NA		62.7	J-	NA		NA	
HSS-H-0-101-07-304A	02/01/06	08/21/07	Surface	REG	mg/kg	NA		**34.8**	J-	NA		**10,700**	J-	NA		195	J-	NA		NA	
HSS-H-0-101-09-004	02/07/06	02/08/06	Surface	REG	mg/kg	2.7	J	**33.3**		7.8		**8,870**		**28,000**		**8,170**		7.1		49.6	
HSS-H-0-101-09-004	02/07/06	11/20/06	Surface	REG	mg/kg	NA		**33.5**	J-	NA		**7,680**	J-	NA		**6,190**	J-	NA		NA	
HSS-H-0-101-09-008	02/07/06	02/08/06	Surface	REG	mg/kg	2.7	J	**39.3**		7.4		**11,900**		**27,200**		323		9.5		45.4	
HSS-H-0-101-09-008	02/07/06	11/20/06	Surface	REG	mg/kg	NA		**57.1**	J-	NA		**12,700**	J-	NA		**413**	J-	NA		NA	
HSS-H-0-101-09-010	02/07/06	11/20/06	Surface	REG	mg/kg	NA		**17.7**	J-	NA		**4,200**	J-	NA		293	J-	NA		NA	
HSS-H-0-101-09-014	02/06/06	08/21/07	Surface	REG	mg/kg	NA		**20.9**	J-	NA		**6,450**	J-	NA		**558**	J-	NA		NA	
HSS-H-0-101-09-025A	02/07/06	08/21/07	Surface	REG	mg/kg	NA		**33.7**	J-	NA		**9,970**	J-	NA		268	J-	NA		NA	
HSS-H-0-101-09-027	02/07/06	08/21/07	Surface	REG	mg/kg	NA		**17.9**	J-	NA		1,910	J-	NA		**1,190**	J-	NA		NA	
HSS-H-0-101-09-032	02/07/06	11/27/06	Surface	REG	mg/kg	NA		**13.3**	J-	NA		2,320	J-	NA		**591**	J-	NA		NA	
HSS-H-0-101-09-033	02/06/06	11/27/06	Surface	REG	mg/kg	NA		**23.1**	J-	NA		2,340	J-	NA		211	J-	NA		NA	
HSS-H-0-101-09-036	02/09/06	11/20/06	Surface	REG	mg/kg	NA		**19.5**	J-	NA		**4,710**	J-	NA		**3,710**	J-	NA		NA	
HSS-H-0-101-09-038	02/09/06	11/20/06	Surface	REG	mg/kg	NA		**116**	J-	NA		**17,200**	J-	NA		**557**	J-	NA		NA	
HSS-H-0-101-09-039	02/10/06	08/21/07	Surface	REG	mg/kg	NA		**10.2**	J-	NA		2,930	J-	NA		85.5	J-	NA		NA	
HSS-H-0-101-09-042	02/09/06	08/21/07	Surface	REG	mg/kg	NA		**16.9**	J-	NA		**3,170**	J-	NA		228	J-	NA		NA	
HSS-H-0-101-09-045	02/10/06	08/21/07	Surface	REG	mg/kg	NA		**19.3**	J-	NA		**4,500**	J-	NA		99.9	J-	NA		NA	
HSS-H-0-101-09-047	02/09/06	02/10/06	Surface	REG	mg/kg	2.2	J	**18.6**		6.5		**12,400**		**27,400**		**510**		10.7		46.3	
HSS-H-0-101-09-047	02/09/06	02/10/06	Surface	FD	mg/kg	2.4	J	**21.5**		7		**12,000**		**26,700**		**1,070**		11.8		46.6	
HSS-H-0-101-09-054	02/10/06	08/21/07	Surface	REG	mg/kg	NA		**23.7**	J-	NA		**8,200**	J-	NA		379	J-	NA		NA	
HSS-H-0-101-09-059	02/07/06	08/21/07	Surface	REG	mg/kg	NA		**9.8**	J-	NA		**4,680**	J-	NA		156	J-	NA		NA	
HSS-H-0-101-09-062	02/08/06	08/21/07	Surface	REG	mg/kg	NA		**26.5**		NA		**4,610**	J	NA		**1,070**		NA		NA	
HSS-H-0-101-09-064	02/08/06	02/10/06	Surface	REG	mg/kg	3	J	**58.6**		9.3		**18,500**		**31,700**		360		19		58.3	
HSS-H-0-101-09-064	02/08/06	11/20/06	Surface	REG	mg/kg	NA		**74.7**	J-	NA		**17,400**	J-	NA		398	J-	NA		NA	
HSS-H-0-101-09-067	02/08/06	11/20/06	Surface	REG	mg/kg	NA		**35.2**	J-	NA		**6,400**	J-	NA		**639**	J-	NA		NA	
HSS-H-0-101-09-068	02/08/06	08/21/07	Surface	REG	mg/kg	NA		**21.0**		NA		**3,290**	J	NA		178		NA		NA	

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Arizona Residential Soil Remediation Level[1] (mg/kg):						**31**		**10**		**39**		**3,100**		**--**		**400**		**390**		**78**	
EPA Region IX Preliminary Remediation Goal[2] (mg/kg):						**31**		**0.39**		**37**		**3,100**		**23,000**		**400**		**390**		**78**	
Location/	**Sample**	**Shipment**		**Sample**		**Antimony**		**Arsenic**		**Cadmium**		**Copper**		**Iron**		**Lead**		**Silver**		**Vanadium**	
Parcel ID	**Date**	**Date**	**Depth**	**Type**	**Units**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**
HSS-H-0-101-09-070	02/07/06	11/20/06	Surface	REG	mg/kg	NA		**20.1**	J-	NA		**3,830**	J-	NA		306	J-	NA		NA	
HSS-H-0-101-09-072	02/07/06	08/21/07	Surface	REG	mg/kg	NA		**34.8**	J-	NA		**9,620**	J-	NA		318	J-	NA		NA	
HSS-H-0-101-09-077	02/08/06	11/20/06	Surface	REG	mg/kg	NA		**33.1**	J-	NA		**6,270**	J-	NA		324	J-	NA		NA	
HSS-H-0-101-09-083	02/10/06	08/21/07	Surface	REG	mg/kg	NA		**15.6**	J-	NA		2,320	J-	NA		**480**	J-	NA		NA	
HSS-H-0-101-09-084	02/10/06	02/10/06	Surface	REG	mg/kg	2.2	J	**28.1**		5.9		**6,680**		22,400		**1,200**		6.2		46.6	
HSS-H-0-101-09-084	02/10/06	11/20/06	Surface	REG	mg/kg	NA		**34.3**		NA		**7,100**		NA		**1,840**	J	NA		NA	
HSS-H-0-101-09-088	02/10/06	11/20/06	Surface	REG	mg/kg	NA		**7.3**		NA		1,270		NA		215	J	NA		NA	
HSS-H-0-101-09-104	02/08/06	02/10/06	Surface	REG	mg/kg	1.7	J	**32.9**		5.2		**11,400**		**25,000**		247		8.1		44.2	
HSS-H-0-101-09-104	02/08/06	11/20/06	Surface	REG	mg/kg	NA		**52.1**	J-	NA		**11,700**	J-	NA		282	J-	NA		NA	
HSS-H-0-101-09-106	02/08/06	11/20/06	Surface	REG	mg/kg	NA		**38.6**	J-	NA		**10,000**	J-	NA		226	J-	NA		NA	
HSS-H-0-101-09-107	02/08/06	11/20/06	Surface	REG	mg/kg	NA		**23**		NA		**6,190**		NA		167		NA		NA	
HSS-H-0-101-09-108	02/08/06	11/20/06	Surface	REG	mg/kg	NA		**62.6**		NA		**14,500**		NA		**496**		NA		NA	
HSS-H-0-101-09-109	02/09/06	02/10/06	Surface	REG	mg/kg	1.7	J	**36.9**		8.1		**15,300**		**36,500**		**512**		10.1		72.4	
HSS-H-0-101-09-109	02/09/06	11/20/06	Surface	REG	mg/kg	NA		**50.9**	J-	NA		**12,400**	J-	NA		**867**	J-	NA		NA	
HSS-H-0-101-09-111B	02/09/06	11/20/06	Surface	REG	mg/kg	NA		**33.6**	J-	NA		**5,250**	J-	NA		151	J-	NA		NA	
HSS-H-0-101-09-115	02/09/06	11/20/06	Surface	REG	mg/kg	NA		**43.2**	J-	NA		**9,010**	J-	NA		355	J-	NA		NA	
HSS-H-0-101-09-120	02/09/06	11/20/06	Surface	REG	mg/kg	NA		**20.9**	J-	NA		**4,700**	J-	NA		119	J-	NA		NA	
HSS-H-0-101-09-134	02/10/06	08/21/07	Surface	REG	mg/kg	NA		**32.4**	J-	NA		**11,200**	J-	NA		144	J-	NA		NA	
HSS-H-0-101-09-137	02/08/06	08/22/07	Surface	REG	mg/kg	NA		**41.1**	J	NA		**7,370**		NA		131	J	NA		NA	
HSS-H-0-101-09-140	02/08/06	08/22/07	Surface	REG	mg/kg	NA		**36.4**	J-	NA		**10,800**	J-	NA		141	J-	NA		NA	
HSS-H-1-101-07-202	01/31/06	08/21/07	Subsurface	REG	mg/kg	NA		**4.6**	J-	NA		497	J-	NA		67.1	J-	NA		NA	
HSS-H-1-101-07-242	01/31/06	08/21/07	Subsurface	REG	mg/kg	NA		**8.4**	J-	NA		1,030	J-	NA		71.9	J-	NA		NA	
HSS-H-1-101-07-251	01/31/06	08/21/07	Subsurface	REG	mg/kg	NA		**3.1**	J-	NA		675	J-	NA		59.6	J-	NA		NA	
HSS-H-1-101-07-270	02/01/06	11/27/06	Subsurface	REG	mg/kg	NA		**8.7**	J-	NA		1,310	J-	NA		77.6	J-	NA		NA	
HSS-H-1-101-07-286	02/01/06	08/21/07	Subsurface	REG	mg/kg	NA		**11.2**	J-	NA		**3,610**	J-	NA		190	J-	NA		NA	
HSS-H-1-101-07-304A	02/01/06	08/21/07	Subsurface	REG	mg/kg	NA		**11.4**	J-	NA		2,500	J-	NA		115	J-	NA		NA	
HSS-H-1-101-09-038	02/09/06	11/20/06	Subsurface	REG	mg/kg	NA		**33.1**	J-	NA		**4,340**	J-	NA		184	J-	NA		NA	
HSS-H-1-101-09-042	02/09/06	08/21/07	Subsurface	REG	mg/kg	NA		**12.1**	J-	NA		1,960	J-	NA		143	J-	NA		NA	
HSS-H-1-101-09-045	02/10/06	08/21/07	Subsurface	REG	mg/kg	NA		**14.1**	J-	NA		1,100	J-	NA		54.5	J-	NA		NA	
HSS-H-1-101-09-068	02/08/06	08/21/07	Subsurface	REG	mg/kg	NA		**8.3**	J-	NA		1,240	J-	NA		203	J-	NA		NA	
HSS-I-0-101-07-008	02/09/06	11/20/06	Surface	REG	mg/kg	NA		**62.4**	J-	NA		**16,100**	J-	NA		392	J-	NA		NA	
HSS-I-0-101-07-010	02/09/06	11/20/06	Surface	REG	mg/kg	NA		**45.6**	J-	NA		**11,900**	J-	NA		355	J-	NA		NA	
HSS-I-0-101-07-014	02/03/06	11/27/06	Surface	REG	mg/kg	NA		**47.3**	J-	NA		**12,500**	J-	NA		**705**	J-	NA		NA	
HSS-I-0-101-07-018	02/06/06	02/08/06	Surface	REG	mg/kg	1.5	J	**54.5**		4.8		**4,060**		22,500		**687**		1.5		44.6	
HSS-I-0-101-07-018	02/06/06	11/27/06	Surface	REG	mg/kg	NA		**56.4**	J-	NA		**5,380**	J-	NA		**1,140**	J-	NA		NA	
HSS-I-0-101-07-027	02/06/06	08/21/07	Surface	REG	mg/kg	NA		**13.6**	J-	NA		**3,870**	J-	NA		103	J-	NA		NA	

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Arizona Residential Soil Remediation Level[1] (mg/kg):						**31**		**10**		**39**		**3,100**		**--**		**400**		**390**		**78**	
EPA Region IX Preliminary Remediation Goal[2] (mg/kg):						**31**		**0.39**		**37**		**3,100**		**23,000**		**400**		**390**		**78**	
Location/	**Sample**	**Shipment**		**Sample**		**Antimony**		**Arsenic**		**Cadmium**		**Copper**		**Iron**		**Lead**		**Silver**		**Vanadium**	
Parcel ID	**Date**	**Date**	**Depth**	**Type**	**Units**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**
HSS-I-0-101-07-028	02/06/06	11/20/06	Surface	REG	mg/kg	NA		**36.4**	J-	NA		**6,890**	J-	NA		189	J-	NA		NA	
HSS-I-0-101-07-029	02/06/06	11/20/06	Surface	REG	mg/kg	NA		**53.8**	J-	NA		**17,800**	J-	NA		**578**	J-	NA		NA	
HSS-I-0-101-07-030	02/06/06	11/28/06	Surface	REG	mg/kg	NA		**35.3**	J-	NA		**18,100**	J-	NA		217	J-	NA		NA	
HSS-I-0-101-07-034	02/09/06	11/20/06	Surface	REG	mg/kg	NA		**26.6**	J-	NA		**5,220**	J-	NA		178	J-	NA		NA	
HSS-I-0-101-07-035AE	02/09/06	02/10/06	Surface	REG	mg/kg	2.7	J	**16**		1.9		**6,310**		17,200		57.8		7.3		41.8	
HSS-I-0-101-07-035AN	02/09/06	11/20/06	Surface	REG	mg/kg	NA		**18.7**	J-	NA		**8,990**	J-	NA		46.8	J-	NA		NA	
HSS-I-0-101-07-035AS	02/09/06	11/20/06	Surface	REG	mg/kg	NA		**22.2**	J-	NA		**24,200**	J-	NA		141	J-	NA		NA	
HSS-I-0-101-07-035AS	02/09/06	11/20/06	Surface	FD	mg/kg	NA		**24.5**	J-	NA		**32,600**	J-	NA		163	J-	NA		NA	
HSS-I-0-101-07-037	02/03/06	11/27/06	Surface	REG	mg/kg	NA		**57.1**	J-	NA		**16,100**	J-	NA		**3,270**	J-	NA		NA	
HSS-I-0-101-07-040	02/03/06	02/03/06	Surface	REG	mg/kg	2.6	J	**62.7**		13.9		**37,800**		**38,800**		320		16.6		57.9	
HSS-I-0-101-07-040	02/03/06	11/20/06	Surface	REG	mg/kg	NA		**98.3**	J-	NA		**41,800**	J-	NA		362	J-	NA		NA	
HSS-I-0-101-07-041	02/03/06	08/21/07	Surface	REG	mg/kg	NA		**8.4**	J-	NA		2,140	J-	NA		104	J-	NA		NA	
HSS-I-0-101-07-042	02/03/06	08/21/07	Surface	REG	mg/kg	NA		**25.0**	J-	NA		**5,660**	J-	NA		335	J-	NA		NA	
HSS-I-0-101-07-042	02/03/06	08/21/07	Surface	FD	mg/kg	NA		**17.5**	J-	NA		**4,250**	J-	NA		399	J-	NA		NA	
HSS-I-0-101-07-046	02/06/06	08/21/07	Surface	REG	mg/kg	NA		**10.6**	J-	NA		2,790	J-	NA		**978**	J-	NA		NA	
HSS-I-0-101-07-047	02/06/06	11/27/06	Surface	REG	mg/kg	NA		**42.1**		NA		**9,960**		NA		**908**	J	NA		NA	
HSS-I-0-101-07-050A	02/03/06	08/21/07	Surface	REG	mg/kg	NA		**7.3**	J-	NA		2,650	J-	NA		80.7	J-	NA		NA	
HSS-I-0-101-07-052	02/02/06	11/20/06	Surface	REG	mg/kg	NA		**17.8**	J-	NA		**5,730**	J-	NA		77.5	J-	NA		NA	
HSS-I-0-101-07-060	02/02/06	02/03/06	Surface	REG	mg/kg	0.87	J	**14.6**		2.9		**3,120**		19,100		155		1.4		43.1	
HSS-I-0-101-07-061	02/02/06	08/21/07	Surface	REG	mg/kg	NA		**12.2**	J-	NA		**3,560**	J-	NA		43.4	J-	NA		NA	
HSS-I-0-101-07-062	02/02/06	11/27/06	Surface	REG	mg/kg	NA		**13.9**		NA		**3,530**		NA		72.2	J	NA		NA	
HSS-I-0-101-07-065	02/06/06	08/22/07	Surface	REG	mg/kg	NA		**18.6**	J-	NA		2,210	J-	NA		**1,280**	J-	NA		NA	
HSS-I-0-101-07-066	02/06/06	02/08/06	Surface	REG	mg/kg	1	J	**9.5**		2.7		2,260		16,900		162		1.9		34.7	
HSS-I-0-101-07-082	02/06/06	08/21/07	Surface	REG	mg/kg	NA		**12.2**	J-	NA		**4,310**	J-	NA		96.5	J-	NA		NA	
HSS-I-0-101-07-089K	02/07/06	11/20/06	Surface	REG	mg/kg	NA		**34.9**	J-	NA		**14,800**	J-	NA		253	J-	NA		NA	
HSS-I-0-101-07-089Q	02/02/06	08/22/07	Surface	REG	mg/kg	NA		**9.4**	J	NA		**5,180**		NA		28.3	J	NA		NA	
HSS-I-0-101-07-089S	02/07/06	02/08/06	Surface	REG	mg/kg	3	J	**63.1**		10.1		**19,300**		**25,000**		246		13		37.8	
HSS-I-0-101-07-089T	02/07/06	02/08/06	Surface	REG	mg/kg	18.1	J	**790**		19.7		**19,700**		**30,600**		**423**		18		37.7	
HSS-I-0-101-07-089T	02/07/06	11/27/06	Surface	REG	mg/kg	NA		**865**	J-	NA		**18,800**	J-	NA		**436**	J-	NA		NA	
HSS-I-0-101-07-089U	02/07/06	02/08/06	Surface	REG	mg/kg	1.1	J	**9.8**		2		**3,710**		18,700		41.9		2.9		39.5	
HSS-I-0-101-07-089U	02/07/06	11/20/06	Surface	REG	mg/kg	NA		**13.8**	J-	NA		**3,970**	J-	NA		42.9	J-	NA		NA	
HSS-I-0-101-07-090	02/02/06	11/20/06	Surface	REG	mg/kg	NA		**52.1**	J-	NA		**21,200**	J-	NA		147	J-	NA		NA	
HSS-I-0-101-07-091	02/02/06	11/20/06	Surface	REG	mg/kg	NA		**14.6**	J-	NA		2,960	J-	NA		35.6	J-	NA		NA	
HSS-I-0-101-07-092A	02/02/06	08/21/07	Surface	REG	mg/kg	NA		**44.1**	J-	NA		**14,400**	J-	NA		235	J-	NA		NA	
HSS-I-0-101-07-099	02/01/06	11/20/06	Surface	REG	mg/kg	NA		**49.1**	J-	NA		**18,000**	J-	NA		**688**	J-	NA		NA	
HSS-I-0-101-07-104	02/01/06	08/21/07	Surface	REG	mg/kg	NA		**21.9**	J-	NA		**7,860**	J-	NA		66.8	J-	NA		NA	

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Arizona Residential Soil Remediation Level[1] (mg/kg):						**31**		**10**		**39**		**3,100**		**--**		**400**		**390**		**78**	
EPA Region IX Preliminary Remediation Goal[2] (mg/kg):						**31**		**0.39**		**37**		**3,100**		**23,000**		**400**		**390**		**78**	
Location/	**Sample**	**Shipment**		**Sample**		**Antimony**		**Arsenic**		**Cadmium**		**Copper**		**Iron**		**Lead**		**Silver**		**Vanadium**	
Parcel ID	**Date**	**Date**	**Depth**	**Type**	**Units**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**
HSS-I-0-101-07-105	02/02/06	11/20/06	Surface	REG	mg/kg	NA		**29.9**	J-	NA		**8,330**	J-	NA		297	J-	NA		NA	
HSS-I-0-101-07-110	02/02/06	08/21/07	Surface	REG	mg/kg	NA		**15.4**	J-	NA		**6,070**	J-	NA		67.3	J-	NA		NA	
HSS-I-0-101-07-111	02/01/06	08/21/07	Surface	REG	mg/kg	NA		**9.7**	J	NA		**5,580**		NA		71.4		NA		NA	
HSS-I-0-101-07-117	02/01/06	11/27/06	Surface	REG	mg/kg	NA		**33.3**	J-	NA		**13,200**	J-	NA		318	J-	NA		NA	
HSS-I-0-101-07-129	02/01/06	08/21/07	Surface	REG	mg/kg	NA		**24.0**	J	NA		**4,830**		NA		139		NA		NA	
HSS-I-0-101-07-142A	01/31/06	02/02/06	Surface	REG	mg/kg	0.69	J	**4.8**		0.44	UJ	268		16,300		24.2		0.11	J	31.9	
HSS-I-0-101-07-149	01/31/06	08/22/07	Surface	REG	mg/kg	NA		**11.2**	J-	NA		2,620	J-	NA		85.6	J-	NA		NA	
HSS-I-0-101-07-176	01/31/06	11/20/06	Surface	REG	mg/kg	NA		**20**	J-	NA		**3,610**	J-	NA		75.1	J-	NA		NA	
HSS-I-0-101-07-185C	01/31/06	08/22/07	Surface	REG	mg/kg	NA		**7.9**	J-	NA		1,020	J-	NA		30.7	J-	NA		NA	
HSS-I-0-101-07-193A	01/31/06	08/22/07	Surface	REG	mg/kg	NA		**14.5**	J-	NA		2,200	J-	NA		105	J-	NA		NA	
HSS-I-0-101-07-202	01/31/06	08/21/07	Surface	REG	mg/kg	NA		**3.9**	J-	NA		381	J-	NA		26.4	J-	NA		NA	
HSS-I-0-101-07-216	01/30/06	08/21/07	Surface	REG	mg/kg	NA		**17.9**	J-	NA		2,260	J-	NA		**474**	J-	NA		NA	
HSS-I-0-101-07-219	01/31/06	08/21/07	Surface	REG	mg/kg	NA		**7.9**	J-	NA		**3,250**	J-	NA		119	J-	NA		NA	
HSS-I-0-101-07-234	02/01/06	08/21/07	Surface	REG	mg/kg	NA		**10.5**	J-	NA		2,690	J-	NA		88.9	J-	NA		NA	
HSS-I-0-101-07-236	02/01/06	08/21/07	Surface	REG	mg/kg	NA		**9.4**	J-	NA		1,680	J-	NA		118	J-	NA		NA	
HSS-I-0-101-07-242	01/31/06	08/21/07	Surface	REG	mg/kg	NA		**12.9**	J-	NA		**5,000**	J-	NA		129	J-	NA		NA	
HSS-I-0-101-07-244	02/01/06	08/21/07	Surface	REG	mg/kg	NA		**7.2**	J-	NA		1,770	J-	NA		58.3	J-	NA		NA	
HSS-I-0-101-07-247	01/31/06	08/21/07	Surface	REG	mg/kg	NA		**10.6**	J-	NA		3,010	J-	NA		264	J-	NA		NA	
HSS-I-0-101-07-251	01/31/06	08/21/07	Surface	REG	mg/kg	NA		**16.2**	J-	NA		**4,480**	J-	NA		144	J-	NA		NA	
HSS-I-0-101-07-259	01/31/06	08/21/07	Surface	REG	mg/kg	NA		**17.2**	J-	NA		2,210	J-	NA		89.9	J-	NA		NA	
HSS-I-0-101-07-270	02/01/06	11/27/06	Surface	REG	mg/kg	NA		**12.6**	J-	NA		1,160	J-	NA		34.6	J-	NA		NA	
HSS-I-0-101-07-284	02/01/06	08/21/07	Surface	REG	mg/kg	NA		**20.7**	J-	NA		**6,330**	J-	NA		181	J-	NA		NA	
HSS-I-0-101-07-286	02/01/06	02/03/06	Surface	REG	mg/kg	1.1	J	**13**		6.1		**6,790**		**25,100**		224		3.9		44.2	
HSS-I-0-101-07-301	02/01/06	08/21/07	Surface	REG	mg/kg	NA		**23.7**	J-	NA		**8,350**	J-	NA		186	J-	NA		NA	
HSS-I-0-101-07-303	02/01/06	08/21/07	Surface	REG	mg/kg	NA		**15.1**	J-	NA		**12,000**	J-	NA		258	J-	NA		NA	
HSS-I-0-101-07-304A	02/01/06	08/21/07	Surface	REG	mg/kg	NA		**24.4**	J-	NA		**5,690**	J-	NA		126	J-	NA		NA	
HSS-I-0-101-09-004	02/07/06	11/20/06	Surface	REG	mg/kg	NA		**37.4**	J-	NA		**8,430**	J-	NA		324	J-	NA		NA	
HSS-I-0-101-09-008	02/07/06	11/20/06	Surface	REG	mg/kg	NA		**28.2**	J-	NA		**4,180**	J-	NA		178	J-	NA		NA	
HSS-I-0-101-09-010	02/07/06	11/20/06	Surface	REG	mg/kg	NA		**20.4**	J-	NA		**6,260**	J-	NA		259	J-	NA		NA	
HSS-I-0-101-09-014	02/06/06	08/21/07	Surface	REG	mg/kg	NA		**17.7**	J-	NA		**6,750**	J-	NA		**476**	J-	NA		NA	
HSS-I-0-101-09-025A	02/07/06	08/21/07	Surface	REG	mg/kg	NA		**7.0**	J-	NA		1,900	J-	NA		26.0	J-	NA		NA	
HSS-I-0-101-09-027	02/07/06	08/21/07	Surface	REG	mg/kg	NA		**18.7**	J-	NA		**4,860**	J-	NA		188	J-	NA		NA	
HSS-I-0-101-09-032	02/07/06	11/27/06	Surface	REG	mg/kg	NA		**27.9**	J-	NA		**7,780**	J-	NA		257	J-	NA		NA	
HSS-I-0-101-09-033	02/06/06	11/27/06	Surface	REG	mg/kg	NA		**62.3**	J-	NA		**7,280**	J-	NA		357	J-	NA		NA	
HSS-I-0-101-09-036	02/09/06	11/20/06	Surface	REG	mg/kg	NA		**27.4**	J-	NA		**8,360**	J-	NA		**910**	J-	NA		NA	
HSS-I-0-101-09-038	02/09/06	11/20/06	Surface	REG	mg/kg	NA		**91.9**	J-	NA		**13,000**	J-	NA		**453**	J-	NA		NA	

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Arizona Residential Soil Remediation Level[1] (mg/kg):						**31**		**10**		**39**		**3,100**		**--**		**400**		**390**		**78**	
EPA Region IX Preliminary Remediation Goal[2] (mg/kg):						**31**		**0.39**		**37**		**3,100**		**23,000**		**400**		**390**		**78**	
Location/	**Sample**	**Shipment**		**Sample**		**Antimony**		**Arsenic**		**Cadmium**		**Copper**		**Iron**		**Lead**		**Silver**		**Vanadium**	
Parcel ID	**Date**	**Date**	**Depth**	**Type**	**Units**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**
HSS-I-0-101-09-039	02/10/06	08/21/07	Surface	REG	mg/kg	NA		**32.5**	J-	NA		**12,600**	J-	NA		**5,210**	J-	NA		NA	
HSS-I-0-101-09-042	02/09/06	08/21/07	Surface	REG	mg/kg	NA		**13.3**	J-	NA		**3,700**	J-	NA		**491**	J-	NA		NA	
HSS-I-0-101-09-045	02/10/06	08/21/07	Surface	REG	mg/kg	NA		**14.0**	J-	NA		**3,310**	J-	NA		122	J-	NA		NA	
HSS-I-0-101-09-047	02/09/06	08/21/07	Surface	REG	mg/kg	NA		**28.5**	J-	NA		**6,920**	J-	NA		352	J-	NA		NA	
HSS-I-0-101-09-054	02/10/06	08/21/07	Surface	REG	mg/kg	NA		**29.9**	J-	NA		**8,880**	J-	NA		**783**	J-	NA		NA	
HSS-I-0-101-09-059	02/07/06	08/21/07	Surface	REG	mg/kg	NA		**4.6**	J-	NA		364	J-	NA		21.9	J-	NA		NA	
HSS-I-0-101-09-062	02/08/06	08/21/07	Surface	REG	mg/kg	NA		**29.7**	J-	NA		**4,300**	J-	NA		**816**	J-	NA		NA	
HSS-I-0-101-09-064	02/08/06	11/20/06	Surface	REG	mg/kg	NA		**9.6**	J-	NA		**3,930**	J-	NA		133	J-	NA		NA	
HSS-I-0-101-09-067	02/08/06	11/20/06	Surface	REG	mg/kg	NA		**39.2**	J-	NA		**6,890**	J-	NA		**847**	J-	NA		NA	
HSS-I-0-101-09-068	02/08/06	08/21/07	Surface	REG	mg/kg	NA		**16.5**	J-	NA		**4,060**	J-	NA		79.9	J-	NA		NA	
HSS-I-0-101-09-070	02/07/06	11/20/06	Surface	REG	mg/kg	NA		**9.9**	J-	NA		**3,420**	J-	NA		306	J-	NA		NA	
HSS-I-0-101-09-072	02/07/06	08/21/07	Surface	REG	mg/kg	NA		**15.4**	J-	NA		**5,690**	J-	NA		65.7	J-	NA		NA	
HSS-I-0-101-09-077	02/08/06	11/20/06	Surface	REG	mg/kg	NA		**37.6**	J-	NA		**4,530**	J-	NA		217	J-	NA		NA	
HSS-I-0-101-09-083	02/10/06	08/21/07	Surface	REG	mg/kg	NA		**7.1**	J-	NA		2,530	J-	NA		**454**	J-	NA		NA	
HSS-I-0-101-09-084	02/10/06	11/20/06	Surface	REG	mg/kg	NA		**28.9**		NA		**7,930**		NA		**951**	J	NA		NA	
HSS-I-0-101-09-088	02/10/06	11/20/06	Surface	REG	mg/kg	NA		**7.5**		NA		761		NA		117	J	NA		NA	
HSS-I-0-101-09-104	02/08/06	11/20/06	Surface	REG	mg/kg	NA		**34.8**	J-	NA		**11,000**	J-	NA		224	J-	NA		NA	
HSS-I-0-101-09-106	02/08/06	02/10/06	Surface	REG	mg/kg	2	J	**24.1**		6.9		**7,070**		**25,200**		**514**		4.9		51.7	
HSS-I-0-101-09-106	02/08/06	02/10/06	Surface	FD	mg/kg	1.3	J	**25**		7.1		**7,480**		**26,100**		**610**		5.4		57.7	
HSS-I-0-101-09-107	02/08/06	11/20/06	Surface	REG	mg/kg	NA		**25.2**		NA		**5,860**		NA		**652**		NA		NA	
HSS-I-0-101-09-108	02/08/06	11/20/06	Surface	REG	mg/kg	NA		**41.1**		NA		**7,050**		NA		**2,470**		NA		NA	
HSS-I-0-101-09-109	02/09/06	11/20/06	Surface	REG	mg/kg	NA		**23.7**	J-	NA		**10,500**	J-	NA		106	J-	NA		NA	
HSS-I-0-101-09-111B	02/09/06	11/20/06	Surface	REG	mg/kg	NA		**72.3**	J-	NA		**16,600**	J-	NA		297	J-	NA		NA	
HSS-I-0-101-09-115	02/09/06	11/20/06	Surface	REG	mg/kg	NA		**28.2**	J-	NA		**6,050**	J-	NA		251	J-	NA		NA	
HSS-I-0-101-09-120	02/09/06	11/20/06	Surface	REG	mg/kg	NA		**32.6**	J-	NA		**6,530**	J-	NA		169	J-	NA		NA	
HSS-I-0-101-09-134	02/10/06	08/21/07	Surface	REG	mg/kg	NA		**10.5**	J-	NA		2,200	J-	NA		66.1	J-	NA		NA	
HSS-I-0-101-09-137	02/08/06	08/22/07	Surface	REG	mg/kg	NA		**32.0**	J	NA		**8,140**		NA		158	J	NA		NA	
HSS-I-0-101-09-140	02/08/06	08/22/07	Surface	REG	mg/kg	NA		**42.2**	J-	NA		**6,190**	J-	NA		164	J-	NA		NA	
HSS-I-1-101-07-034	02/09/06	11/20/06	Subsurface	REG	mg/kg	NA		**13.1**	J-	NA		2,400	J-	NA		92.5	J-	NA		NA	
HSS-I-1-101-07-034	02/09/06	11/20/06	Subsurface	FD	mg/kg	NA		**11.4**	J-	NA		2,060	J-	NA		82	J-	NA		NA	
HSS-I-1-101-07-040	02/03/06	11/20/06	Subsurface	REG	mg/kg	NA		**25.1**	J-	NA		**9,490**	J-	NA		99.2	J-	NA		NA	
HSS-I-1-101-07-041	02/03/06	08/21/07	Subsurface	REG	mg/kg	NA		**2.7**	J-	NA		208	J-	NA		18.2	J-	NA		NA	
HSS-I-1-101-07-089U	02/07/06	11/20/06	Subsurface	REG	mg/kg	NA		**16.7**	J-	NA		1,390	J-	NA		22.5	J-	NA		NA	
HSS-I-1-101-07-092A	02/02/06	08/21/07	Subsurface	REG	mg/kg	NA		**6.6**	J-	NA		2,130	J-	NA		**1,340**	J-	NA		NA	
HSS-I-1-101-07-099	02/01/06	11/20/06	Subsurface	REG	mg/kg	NA		**5.3**	J-	NA		817	J-	NA		19.7	J-	NA		NA	
HSS-I-1-101-07-117	02/01/06	11/27/06	Subsurface	REG	mg/kg	NA		**8.8**	J-	NA		134	J-	NA		16.5	J-	NA		NA	

TABLE 4-9
Soil Sampling Laboratory Value Exceedances for Full Inorganic Target Analyte List
Hayden Residential Properties
Remedial Investigation Report
ASARCO LLC Hayden, Arizona Plant Site

The data in this table are illustrated on figures 4-5, 4-13, 4-15, 4-17, 4-63, 4-64, 4-65, 4-66, 4-67, 4-68, and 4-69.

Arizona Residential Soil Remediation Level[1] (mg/kg):						**31**		**10**		**39**		**3,100**		**--**		**400**		**390**		**78**	
EPA Region IX Preliminary Remediation Goal[2] (mg/kg):						**31**		**0.39**		**37**		**3,100**		**23,000**		**400**		**390**		**78**	
Location/	**Sample**	**Shipment**		**Sample**		**Antimony**		**Arsenic**		**Cadmium**		**Copper**		**Iron**		**Lead**		**Silver**		**Vanadium**	
Parcel ID	**Date**	**Date**	**Depth**	**Type**	**Units**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**
HSS-I-1-101-07-234	02/01/06	08/21/07	Subsurface	REG	mg/kg	NA		**25.8**	J-	NA		2,600	J-	NA		**506**	J-	NA		NA	
HSS-I-1-101-09-137	02/08/06	08/22/07	Subsurface	REG	mg/kg	NA		**12.1**	J	NA		2,160		NA		113	J	NA		NA	
Minimum Detected Result:						0.47		**0.51**		0.52		30.3		8,530		6.2		0.11		16.3	
Maximum Detected Result:						**126**		**865**		**147**		**76,600**		**84,400**		**92,600**		**655**		**80.7**	
Arithmetic Mean Detected Result:						2.88		**25.95**		6.20		**6,401.71**		**24,318.47**		**452.44**		10.61		44.42	

Table Notes:

[1] Arizona Department of Environmental Quality Residential Soil Remediation Levels, Title 18 Chapter 7, January 2008
[2] EPA Region IX Preliminary Remediation Goals, Residential Soil, October 2004
[3] Bold values with bold outline exceed one or more of the comparison criteria.
[4] Bold italicized values have detection limits above one or more of the comparison criteria.
[5] -- = Not established
[6] FD = Field duplicate
[7] J = Estimated value
[8] J- = Estimated value, may be biased low
[9] mg/kg = milligrams per kilogram
[10] NA = Not analyzed
[11] REG = Regular sample
[12] Subsurface = The sample was collected approximately 10-12 inches below surface.
[13] Surface = The sample was collected approximately 0-2 inches below surface.
[14] U = Not detected; reporting limit is shown in place of a result.
[15] UJ = Not detected; reporting limit is approximate and is shown in place of a result.

TABLE 4-10

Summary of Soil Sampling Laboratory Values Mean, Maximum and 95% Upper Confidence Level for Arsenic, Copper and Lead
Winkelman Residential Properties
Remedial Investigation Report
ASARCO LLC Hayden, Arizona Plant Site

The data in this table are illustrated on figures 4-18, 4-20, and 4-22.

Arizona Residential Soil Remediation Level[1] (mg/kg):		**10**			**3,100**			**400**		
EPA Region IX Preliminary Remediation Goal[2] (mg/kg):		**0.39**			**3,100**			**400**		
		Arsenic			**Copper**			**Lead**		
Parcel Number	**Units**	**Mean Detected**	**Maximum Detected**	**95% UCL**	**Mean Detected**	**Maximum Detected**	**95% UCL**	**Mean Detected**	**Maximum Detected**	**95% UCL**
101-10-019	mg/kg	**4.14**	**4.7**	**4.46**	384	490	417	24.3	37.2	28.6
101-10-023	mg/kg	**5.41**	**6.9**	**6.06**	463	657	536	43.7	67.9	51.3
101-12-008F	mg/kg	**3.83**	**9**	**5.48**	486	1,110	655	37.1	99.9	59.4
101-12-008J	mg/kg	**14.5**	**28**	**20.1**	293	519	364	127	392	248
101-12-008K	mg/kg	**3.8**	**4.5**	**4.13**	443	825	598	28.4	49.1	34.8
101-12-023A	mg/kg	**4.47**	**6.2**	**5.03**	255	646	383	141	**667**	341
101-12-071	mg/kg	**45**	**165**	**112**	506	1,190	692	106	274	179
101-12-073	mg/kg	**5.9**	**11.1**	**8.02**	454	677	547	102	185	128
101-12-075	mg/kg	**3.09**	**5.6**	**4.05**	470	796	603	77.3	211	128
101-12-093	mg/kg	**6**	**12.4**	**7.43**	752	1,990	1,040	79.8	176	101
101-12-094A	mg/kg	**5.45**	**15.5**	**7.89**	495	1,050	632	74.6	116	91.8
101-12-101C	mg/kg	**5.22**	**10**	**6.4**	353	521	404	185	**780**	**517**
101-12-102	mg/kg	**5.64**	**6.8**	**6.04**	456	698	540	162	360	221
101-12-108	mg/kg	**5.2**	**7.8**	**6.06**	436	734	553	85.6	205	124
101-12-130	mg/kg	**4.76**	**6.8**	**5.41**	659	930	787	81.5	156	104
101-12-136	mg/kg	**4.17**	**6.8**	**4.97**	304	620	396	51.3	100	64.8
101-12-142	mg/kg	**11.1**	**34.1**	**16.6**	1,090	1,970	1,390	293	**577**	387
101-12-147A	mg/kg	**5.09**	**8.3**	**6.08**	501	930	631	87.8	234	133
101-12-149	mg/kg	**15.1**	**82.7**	**45.3**	1,730	**9,190**	**5,130**	327	**2,330**	**2,330**
101-12-150	mg/kg	**19.4**	**55.9**	**34.7**	**3,230**	**6,790**	**4,410**	343	**1,160**	**804**
101-12-154A	mg/kg	**3.89**	**6.3**	**4.68**	564	1,070	780	94	167	114
101-12-155	mg/kg	**2.99**	**7.1**	**4.22**	564	908	743	226	**1,510**	**1,510**
101-12-187	mg/kg	**1.82**	**4.9**	**2.8**	259	431	324	38.3	69.8	52

TABLE 4-10

Summary of Soil Sampling Laboratory Values Mean, Maximum and 95% Upper Confidence Level for Arsenic, Copper and Lead
Winkelman Residential Properties
Remedial Investigation Report
ASARCO LLC Hayden, Arizona Plant Site

The data in this table are illustrated on figures 4-18, 4-20, and 4-22.

Arizona Residential Soil Remediation Level[1] (mg/kg):		**10**			**3,100**			**400**		
EPA Region IX Preliminary Remediation Goal[2] (mg/kg):		**0.39**			**3,100**			**400**		
		Arsenic			**Copper**			**Lead**		
Parcel Number	**Units**	**Mean Detected**	**Maximum Detected**	**95% UCL**	**Mean Detected**	**Maximum Detected**	**95% UCL**	**Mean Detected**	**Maximum Detected**	**95% UCL**
101-12-188B	mg/kg	**3.71**	**4.8**	**4.41**	335	489	391	35.3	53	42.3
101-12-193	mg/kg	**5.43**	**7**	**6.01**	484	1,070	663	**699**	**3,330**	**1,730**
101-12-204	mg/kg	**5.7**	**7.4**	**6.4**	530	1,110	712	55.8	110	75.1
101-12-234	mg/kg	**5.06**	**9.1**	**6.73**	226	324	276	137	**430**	265
101-12-236	mg/kg	**4.32**	**7.3**	**5.41**	454	1,050	643	82.2	176	122
101-12-241	mg/kg	**4.2**	**6.3**	**4.83**	295	491	374	37.5	126	60.3
101-12-267	mg/kg	**5.71**	**9**	**6.78**	290	489	367	77.7	216	167
101-12-288	mg/kg	**4.2**	**5.9**	**4.76**	269	417	338	78.4	**433**	273

Table Notes:

[1] Arizona Department of Environmental Quality Residential Soil Remediation Levels, Title 18 Chapter 7, January 2008

[2] EPA Region IX Preliminary Remediation Goals, Residential Soil, October 2004

[3] Bold values with bold outline exceed one or more of the comparison criteria.

[4] mg/kg = milligrams per kilogram

TABLE 4-11
Soil Sampling Laboratory Value Exceedances for Full Inorganic Target Analyte List
Winkelman Residential Properties
Remedial Investigation Report
ASARCO LLC Hayden, Arizona Plant Site

The data in this table are illustrated on figures 4-19, 4-21, and 4-23.

Arizona Residential Soil Remediation Level[1] (mg/kg):						**10**		**3,100**		**--**		**400**	
EPA Region IX Preliminary Remediation Goal[2] (mg/kg):						**0.39**		**3,100**		**23,000**		**400**	
Location/	**Sample**	**Shipment**		**Sample**		**Arsenic**		**Copper**		**Iron**		**Lead**	
Parcel ID	**Date**	**Date**	**Depth**	**Type**	**Units**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**
WSS-A-0-101-10-019	01/30/06	08/28/07	Surface	REG	mg/kg	**3.6**	J-	345	J-	NA		20.4	J-
WSS-A-0-101-10-019	01/30/06	08/28/07	Surface	FD	mg/kg	**3.8**	J-	321	J-	NA		20.5	J-
WSS-A-0-101-10-023	01/30/06	08/28/07	Surface	REG	mg/kg	**5.5**	J-	598	J-	NA		67.9	J-
WSS-A-0-101-10-023	01/30/06	08/28/07	Surface	FD	mg/kg	**5.2**	J-	548	J-	NA		62.3	J-
WSS-A-0-101-12-008F	02/13/06	02/15/06	Surface	REG	mg/kg	**3.2**		493		17,800		25.2	
WSS-A-0-101-12-008J	02/13/06	08/29/07	Surface	REG	mg/kg	**3.4**	J-	169	J-	NA		21.9	J-
WSS-A-0-101-12-008J	02/13/06	08/29/07	Surface	FD	mg/kg	**4.1**	J-	249	J-	NA		29.2	J-
WSS-A-0-101-12-008K	02/13/06	08/29/07	Surface	REG	mg/kg	**3.6**	J-	200	J-	NA		22.2	J-
WSS-A-0-101-12-008K	02/13/06	08/29/07	Surface	FD	mg/kg	**4.4**	J-	182	J-	NA		20.4	J-
WSS-A-0-101-12-023A	02/13/06	08/29/07	Surface	REG	mg/kg	**5.0**	J-	505	J-	NA		**582**	J-
WSS-A-0-101-12-023A	02/13/06	08/29/07	Surface	FD	mg/kg	**4.5**	J-	448	J-	NA		**667**	J-
WSS-A-0-101-12-071	02/13/06	02/15/06	Surface	REG	mg/kg	**145**		564		20,400		199	
WSS-A-0-101-12-073	02/13/06	08/29/07	Surface	REG	mg/kg	**11.1**	J-	505	J-	NA		102	J-
WSS-A-0-101-12-073	02/13/06	08/29/07	Surface	FD	mg/kg	**9.5**	J-	464	J-	NA		97.6	J-
WSS-A-0-101-12-075	02/13/06	08/29/07	Surface	REG	mg/kg	**2.8**		461		NA		63.2	
WSS-A-0-101-12-075	02/13/06	08/29/07	Surface	FD	mg/kg	**3.2**		444		NA		59.2	
WSS-A-0-101-12-093	02/13/06	08/29/07	Surface	REG	mg/kg	**3.0**		665		NA		92.1	
WSS-A-0-101-12-093	02/13/06	08/29/07	Surface	FD	mg/kg	**3.3**		635		NA		79.9	
WSS-A-0-101-12-094A	02/14/06	02/15/06	Surface	REG	mg/kg	**3.3**		258		13,500		80.9	
WSS-A-0-101-12-101C	02/13/06	08/30/07	Surface	REG	mg/kg	**3.7**	J-	290	J-	NA		61.4	J-
WSS-A-0-101-12-101C	02/13/06	08/30/07	Surface	FD	mg/kg	**4.1**	J-	370	J-	NA		85.7	J-
WSS-A-0-101-12-102	02/13/06	02/15/06	Surface	REG	mg/kg	**5.4**		379		16,900		109	

TABLE 4-11
Soil Sampling Laboratory Value Exceedances for Full Inorganic Target Analyte List
Winkelman Residential Properties
Remedial Investigation Report
ASARCO LLC Hayden, Arizona Plant Site

The data in this table are illustrated on figures 4-19, 4-21, and 4-23.

Arizona Residential Soil Remediation Level[1] (mg/kg):						**10**		**3,100**		**--**		**400**	
EPA Region IX Preliminary Remediation Goal[2] (mg/kg):						**0.39**		**3,100**		**23,000**		**400**	
Location/	**Sample**	**Shipment**		**Sample**		**Arsenic**		**Copper**		**Iron**		**Lead**	
Parcel ID	**Date**	**Date**	**Depth**	**Type**	**Units**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**
WSS-A-0-101-12-108	02/14/06	08/30/07	Surface	REG	mg/kg	**5.7**	J-	358	J-	NA		114	J-
WSS-A-0-101-12-108	02/14/06	08/30/07	Surface	FD	mg/kg	**5.9**	J-	401	J-	NA		108	J-
WSS-A-0-101-12-130	02/14/06	08/30/07	Surface	REG	mg/kg	**4.6**	J-	401	J-	NA		48.5	J-
WSS-A-0-101-12-130	02/14/06	08/30/07	Surface	FD	mg/kg	**3.9**	J-	386	J-	NA		53.0	J-
WSS-A-0-101-12-136	02/14/06	08/30/07	Surface	REG	mg/kg	**3.7**	J-	198	J-	NA		41.0	J-
WSS-A-0-101-12-136	02/14/06	08/30/07	Surface	FD	mg/kg	**4.1**	J-	204	J-	NA		40.3	J-
WSS-A-0-101-12-142	02/14/06	02/15/06	Surface	REG	mg/kg	**6**		674		12,800		285	
WSS-A-0-101-12-142	02/14/06	09/14/07	Surface	REG	mg/kg	**11.8**	J-	1,170	J-	NA		**491**	J-
WSS-A-0-101-12-147A	02/14/06	08/30/07	Surface	REG	mg/kg	**7.6**	J-	869	J-	NA		234	J-
WSS-A-0-101-12-147A	02/14/06	08/30/07	Surface	FD	mg/kg	**8.3**	J-	930	J-	NA		223	J-
WSS-A-0-101-12-149	02/14/06	08/30/07	Surface	REG	mg/kg	**4.4**	J-	411	J-	NA		59.5	J-
WSS-A-0-101-12-149	02/14/06	08/30/07	Surface	FD	mg/kg	**4.7**	J-	520	J-	NA		76.5	J-
WSS-A-0-101-12-150	02/14/06	08/30/07	Surface	REG	mg/kg	**11.7**	J-	2,290	J-	NA		171	J-
WSS-A-0-101-12-150	02/14/06	08/30/07	Surface	FD	mg/kg	**10.6**	J-	2,050	J-	NA		159	J-
WSS-A-0-101-12-154A	02/15/06	08/30/07	Surface	REG	mg/kg	**4.6**		918		NA		154	
WSS-A-0-101-12-154A	02/15/06	08/30/07	Surface	FD	mg/kg	**5.6**		1,030		NA		167	
WSS-A-0-101-12-155	02/15/06	08/30/07	Surface	REG	mg/kg	**6.5**		746		NA		**1,250**	
WSS-A-0-101-12-155	02/15/06	08/30/07	Surface	FD	mg/kg	**7.1**		899		NA		**1,510**	
WSS-A-0-101-12-187	02/14/06	08/31/07	Surface	REG	mg/kg	**0.94**	J-	165	J-	NA		12.3	J-
WSS-A-0-101-12-187	02/14/06	08/31/07	Surface	FD	mg/kg	***1.0***	U	182	J-	NA		14.4	J-
WSS-A-0-101-12-188B	02/14/06	08/31/07	Surface	REG	mg/kg	**0.55**	J-	247	J-	NA		23.4	J-
WSS-A-0-101-12-188B	02/14/06	08/31/07	Surface	FD	mg/kg	**0.96**	J-	337	J-	NA		28.8	J-

TABLE 4-11
Soil Sampling Laboratory Value Exceedances for Full Inorganic Target Analyte List
Winkelman Residential Properties
Remedial Investigation Report
ASARCO LLC Hayden, Arizona Plant Site

The data in this table are illustrated on figures 4-19, 4-21, and 4-23.

Arizona Residential Soil Remediation Level[1] (mg/kg):						**10**		**3,100**		**--**		**400**	
EPA Region IX Preliminary Remediation Goal[2] (mg/kg):						**0.39**		**3,100**		**23,000**		**400**	
Location/	**Sample**	**Shipment**		**Sample**		**Arsenic**		**Copper**		**Iron**		**Lead**	
Parcel ID	**Date**	**Date**	**Depth**	**Type**	**Units**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**
WSS-A-0-101-12-193	01/30/06	08/31/07	Surface	REG	mg/kg	**6.5**	J-	789	J-	NA		205	J-
WSS-A-0-101-12-193	01/30/06	08/31/07	Surface	FD	mg/kg	**7.0**	J-	787	J-	NA		**484**	J-
WSS-A-0-101-12-204	02/15/06	02/15/06	Surface	REG	mg/kg	**5.5**		311		17,200		36.9	
WSS-A-0-101-12-234	01/30/06	08/31/07	Surface	REG	mg/kg	**4.2**	J-	261	J-	NA		60.7	J-
WSS-A-0-101-12-234	01/30/06	08/31/07	Surface	FD	mg/kg	**5.0**	J-	294	J-	NA		63.3	J-
WSS-A-0-101-12-236	02/14/06	02/15/06	Surface	REG	mg/kg	**5.7**		486		18,600		176	
WSS-A-0-101-12-241	02/14/06	08/31/07	Surface	REG	mg/kg	**5.0**	J-	304	J-	NA		31.4	J-
WSS-A-0-101-12-241	02/14/06	08/31/07	Surface	FD	mg/kg	**5.1**	J-	283	J-	NA		33.2	J-
WSS-A-0-101-12-267	02/14/06	08/31/07	Surface	REG	mg/kg	**6.0**	J-	190	J-	NA		120	J-
WSS-A-0-101-12-267	02/14/06	08/31/07	Surface	FD	mg/kg	**4.9**	J-	174	J-	NA		114	J-
WSS-A-0-101-12-288	02/13/06	08/31/07	Surface	REG	mg/kg	**3.0**	J-	157	J-	NA		27.3	J-
WSS-A-0-101-12-288	02/13/06	08/31/07	Surface	FD	mg/kg	**3.9**	J-	157	J-	NA		31.8	J-
WSS-B-0-101-10-019	01/30/06	08/28/07	Surface	REG	mg/kg	**4.1**	J-	364	J-	NA		26.4	J-
WSS-B-0-101-10-023	01/30/06	08/28/07	Surface	REG	mg/kg	**5.7**	J-	445	J-	NA		38.0	J-
WSS-B-0-101-12-008F	02/13/06	02/15/06	Surface	REG	mg/kg	**2.3**		231		17,300		16	
WSS-B-0-101-12-008J	02/13/06	08/29/07	Surface	REG	mg/kg	**25.9**	J-	325	J-	NA		392	J-
WSS-B-0-101-12-008K	02/13/06	02/15/06	Surface	REG	mg/kg	**2.3**		426		12,800		31.2	
WSS-B-0-101-12-008K	02/13/06	09/14/07	Surface	REG	mg/kg	**3.6**	J-	509	J-	NA		37.1	J-
WSS-B-0-101-12-023A	02/13/06	08/29/07	Surface	REG	mg/kg	**5.0**	J-	153	J-	NA		41.6	J-
WSS-B-0-101-12-071	02/13/06	02/15/06	Surface	REG	mg/kg	**165**		1,190		21,400		274	
WSS-B-0-101-12-073	02/13/06	08/29/07	Surface	REG	mg/kg	**10.6**	J-	602	J-	NA		185	J-
WSS-B-0-101-12-075	02/13/06	08/29/07	Surface	REG	mg/kg	**5.6**		796		NA		211	

TABLE 4-11
Soil Sampling Laboratory Value Exceedances for Full Inorganic Target Analyte List
Winkelman Residential Properties
Remedial Investigation Report
ASARCO LLC Hayden, Arizona Plant Site

The data in this table are illustrated on figures 4-19, 4-21, and 4-23.

Arizona Residential Soil Remediation Level[1] (mg/kg):						**10**		**3,100**		**--**		**400**	
EPA Region IX Preliminary Remediation Goal[2] (mg/kg):						**0.39**		**3,100**		**23,000**		**400**	
Location/	**Sample**	**Shipment**		**Sample**		**Arsenic**		**Copper**		**Iron**		**Lead**	
Parcel ID	**Date**	**Date**	**Depth**	**Type**	**Units**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**
WSS-B-0-101-12-093	02/13/06	02/15/06	Surface	REG	mg/kg	**6.2**		810		14,800		84.2	
WSS-B-0-101-12-094A	02/14/06	02/15/06	Surface	REG	mg/kg	**3.4**		315		14,100		31.9	
WSS-B-0-101-12-101C	02/13/06	08/30/07	Surface	REG	mg/kg	**4.8**	J-	322	J-	NA		95.7	J-
WSS-B-0-101-12-102	02/13/06	08/30/07	Surface	REG	mg/kg	**4.0**	J-	229	J-	NA		35.7	J-
WSS-B-0-101-12-102	02/13/06	08/30/07	Surface	FD	mg/kg	**4.8**	J-	216	J-	NA		34.5	J-
WSS-B-0-101-12-108	02/14/06	02/15/06	Surface	REG	mg/kg	**3.1**		277		12,100		63.2	
WSS-B-0-101-12-130	02/14/06	08/30/07	Surface	REG	mg/kg	**5.0**	J-	680	J-	NA		90.2	J-
WSS-B-0-101-12-136	02/14/06	08/30/07	Surface	REG	mg/kg	**6.8**	J-	356	J-	NA		54.7	J-
WSS-B-0-101-12-142	02/14/06	08/30/07	Surface	REG	mg/kg	**12.8**	J-	1,800	J-	NA		**577**	J-
WSS-B-0-101-12-142	02/14/06	08/30/07	Surface	FD	mg/kg	**14.2**	J-	1,970	J-	NA		**541**	J-
WSS-B-0-101-12-147A	02/14/06	08/30/07	Surface	REG	mg/kg	**3.3**	J-	416	J-	NA		45.4	J-
WSS-B-0-101-12-149	02/14/06	08/30/07	Surface	REG	mg/kg	**3.9**	J-	423	J-	NA		87.6	J-
WSS-B-0-101-12-150	02/14/06	08/30/07	Surface	REG	mg/kg	**8.5**	J-	1,870	J-	NA		**641**	J-
WSS-B-0-101-12-154A	02/15/06	02/15/06	Surface	REG	mg/kg	**4**		561		15,400		53.7	
WSS-B-0-101-12-155	02/15/06	08/30/07	Surface	REG	mg/kg	**1.3**		264		NA		96.3	
WSS-B-0-101-12-187	02/14/06	08/31/07	Surface	REG	mg/kg	***1.0***	U	171	J-	NA		22.6	J-
WSS-B-0-101-12-188B	02/14/06	08/31/07	Surface	REG	mg/kg	**4.1**	J-	385	J-	NA		38.7	J-
WSS-B-0-101-12-193	01/30/06	02/02/06	Surface	REG	mg/kg	**5.2**		389		16,600		85.9	
WSS-B-0-101-12-204	02/15/06	08/31/07	Surface	REG	mg/kg	**6.0**	J-	577	J-	NA		76.4	J-
WSS-B-0-101-12-204	02/15/06	08/31/07	Surface	FD	mg/kg	**6.9**	J-	648	J-	NA		60.3	J-
WSS-B-0-101-12-234	01/30/06	08/31/07	Surface	REG	mg/kg	**3.8**	J-	267	J-	NA		108	J-
WSS-B-0-101-12-236	02/14/06	02/15/06	Surface	REG	mg/kg	**3.8**		220		18,400		24.3	

TABLE 4-11
Soil Sampling Laboratory Value Exceedances for Full Inorganic Target Analyte List
Winkelman Residential Properties
Remedial Investigation Report
ASARCO LLC Hayden, Arizona Plant Site

The data in this table are illustrated on figures 4-19, 4-21, and 4-23.

Arizona Residential Soil Remediation Level[1] (mg/kg):						**10**		**3,100**		**--**		**400**	
EPA Region IX Preliminary Remediation Goal[2] (mg/kg):						**0.39**		**3,100**		**23,000**		**400**	
Location/	**Sample**	**Shipment**		**Sample**		**Arsenic**		**Copper**		**Iron**		**Lead**	
Parcel ID	**Date**	**Date**	**Depth**	**Type**	**Units**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**
WSS-B-0-101-12-241	02/14/06	08/31/07	Surface	REG	mg/kg	**4.2**	J-	241	J-	NA		30.2	J-
WSS-B-0-101-12-267	02/14/06	08/31/07	Surface	REG	mg/kg	**6.9**	J-	363	J-	NA		216	J-
WSS-B-0-101-12-288	02/13/06	08/31/07	Surface	REG	mg/kg	**5.9**	J-	207	J-	NA		22.8	J-
WSS-B-1-101-12-008F	02/13/06	08/28/07	Subsurface	REG	mg/kg	**5.1**	J-	262	J-	NA		21.8	J-
WSS-B-1-101-12-023A	02/13/06	08/29/07	Subsurface	REG	mg/kg	**4.1**	J-	132	J-	NA		89.3	J-
WSS-B-1-101-12-073	02/13/06	08/29/07	Subsurface	REG	mg/kg	**8.9**	J-	332	J-	NA		137	J-
WSS-B-1-101-12-075	02/13/06	08/29/07	Subsurface	REG	mg/kg	**1.6**		170		NA		98.1	
WSS-B-1-101-12-136	02/14/06	08/30/07	Subsurface	REG	mg/kg	**3.9**	J-	76.1	J-	NA		21.7	J-
WSS-B-1-101-12-236	02/14/06	08/31/07	Subsurface	REG	mg/kg	**5.8**	J-	112	J-	NA		195	J-
WSS-B-1-101-12-267	02/14/06	08/31/07	Subsurface	REG	mg/kg	**5.4**	J-	166	J-	NA		59.9	J-
WSS-B-1-101-12-288	02/13/06	08/31/07	Subsurface	REG	mg/kg	**5.7**	J-	150	J-	NA		52.1	J-
WSS-C-0-101-10-019	01/30/06	08/28/07	Surface	REG	mg/kg	**4.5**	J-	341	J-	NA		23.7	J-
WSS-C-0-101-10-023	01/30/06	08/28/07	Surface	REG	mg/kg	**5.4**	J-	313	J-	NA		27.8	J-
WSS-C-0-101-12-008F	02/13/06	02/15/06	Surface	REG	mg/kg	**1.9**		190		13,800		12.9	
WSS-C-0-101-12-008J	02/13/06	02/15/06	Surface	REG	mg/kg	**20**		315		14,700		130	
WSS-C-0-101-12-008J	02/13/06	09/14/07	Surface	REG	mg/kg	**22.5**	J-	342	J-	NA		198	J-
WSS-C-0-101-12-008K	02/13/06	08/29/07	Surface	REG	mg/kg	**4.5**	J-	825	J-	NA		49.1	J-
WSS-C-0-101-12-023A	02/13/06	08/29/07	Surface	REG	mg/kg	**4.4**	J-	75.6	J-	NA		23.1	J-
WSS-C-0-101-12-071	02/13/06	11/27/06	Surface	REG	mg/kg	**18.4**	J-	534	J-	NA		109	J-
WSS-C-0-101-12-073	02/13/06	08/29/07	Surface	REG	mg/kg	**8.3**	J-	509	J-	NA		115	J-
WSS-C-0-101-12-075	02/13/06	08/29/07	Surface	REG	mg/kg	**1.1**		181		NA		17.5	
WSS-C-0-101-12-093	02/13/06	08/29/07	Surface	REG	mg/kg	**4.3**		837		NA		73.1	

TABLE 4-11
Soil Sampling Laboratory Value Exceedances for Full Inorganic Target Analyte List
Winkelman Residential Properties
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ASARCO LLC Hayden, Arizona Plant Site

The data in this table are illustrated on figures 4-19, 4-21, and 4-23.

Arizona Residential Soil Remediation Level[1] (mg/kg):						**10**		**3,100**		**--**		**400**	
EPA Region IX Preliminary Remediation Goal[2] (mg/kg):						**0.39**		**3,100**		**23,000**		**400**	
Location/	**Sample**	**Shipment**		**Sample**		**Arsenic**		**Copper**		**Iron**		**Lead**	
Parcel ID	**Date**	**Date**	**Depth**	**Type**	**Units**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**
WSS-C-0-101-12-094A	02/14/06	02/15/06	Surface	REG	mg/kg	**4.9**		442		15,000		77	
WSS-C-0-101-12-101C	02/13/06	08/30/07	Surface	REG	mg/kg	**4.8**	J-	276	J-	NA		79.6	J-
WSS-C-0-101-12-102	02/13/06	08/30/07	Surface	REG	mg/kg	**5.3**	J-	450	J-	NA		245	J-
WSS-C-0-101-12-108	02/14/06	08/30/07	Surface	REG	mg/kg	**6.4**	J-	734	J-	NA		205	J-
WSS-C-0-101-12-130	02/14/06	08/30/07	Surface	REG	mg/kg	**6.3**	J-	816	J-	NA		156	J-
WSS-C-0-101-12-136	02/14/06	08/30/07	Surface	REG	mg/kg	**2.5**	J-	178	J-	NA		17.0	J-
WSS-C-0-101-12-142	02/14/06	08/30/07	Surface	REG	mg/kg	**8.3**	J-	962	J-	NA		195	J-
WSS-C-0-101-12-147A	02/14/06	02/15/06	Surface	REG	mg/kg	**5.1**		442		14,800		64.2	
WSS-C-0-101-12-149	02/14/06	08/30/07	Surface	REG	mg/kg	**5.8**	J-	577	J-	NA		99.5	J-
WSS-C-0-101-12-150	02/14/06	08/30/07	Surface	REG	mg/kg	**13.9**	J-	2,350	J-	NA		145	J-
WSS-C-0-101-12-154A	02/15/06	08/30/07	Surface	REG	mg/kg	**3.6**		487		NA		90.7	
WSS-C-0-101-12-155	02/15/06	02/15/06	Surface	REG	mg/kg	**4.1**		908		15,700		53.3	
WSS-C-0-101-12-187	02/14/06	08/31/07	Surface	REG	mg/kg	**3.5**	J-	251	J-	NA		63.2	J-
WSS-C-0-101-12-188B	02/14/06	08/31/07	Surface	REG	mg/kg	**4.5**	J-	351	J-	NA		53.0	J-
WSS-C-0-101-12-193	01/30/06	09/14/07	Surface	REG	mg/kg	**4.8**	J-	218	J-	NA		**960**	J-
WSS-C-0-101-12-204	02/15/06	08/31/07	Surface	REG	mg/kg	**7.4**	J-	1,110	J-	NA		110	J-
WSS-C-0-101-12-234	01/30/06	02/02/06	Surface	REG	mg/kg	**2.9**		193		13,500		35.9	
WSS-C-0-101-12-236	02/14/06	02/15/06	Surface	REG	mg/kg	**3.8**		718		15,700		70.1	
WSS-C-0-101-12-241	02/14/06	02/15/06	Surface	REG	mg/kg	**2.9**		174		17,100		19.2	
WSS-C-0-101-12-267	02/14/06	08/31/07	Surface	REG	mg/kg	**4.9**	J-	489	J-	NA		37.5	J-
WSS-C-0-101-12-288	02/13/06	08/31/07	Surface	REG	mg/kg	**4.0**	J-	286	J-	NA		23.7	J-
WSS-C-1-101-12-071	02/13/06	11/27/06	Subsurface	REG	mg/kg	**5.6**	J-	93.7	J-	NA		23.5	J-

TABLE 4-11
Soil Sampling Laboratory Value Exceedances for Full Inorganic Target Analyte List
Winkelman Residential Properties
Remedial Investigation Report
ASARCO LLC Hayden, Arizona Plant Site

The data in this table are illustrated on figures 4-19, 4-21, and 4-23.

Arizona Residential Soil Remediation Level[1] (mg/kg):						**10**		**3,100**		**--**		**400**	
EPA Region IX Preliminary Remediation Goal[2] (mg/kg):						**0.39**		**3,100**		**23,000**		**400**	
Location/	**Sample**	**Shipment**		**Sample**		**Arsenic**		**Copper**		**Iron**		**Lead**	
Parcel ID	**Date**	**Date**	**Depth**	**Type**	**Units**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**
WSS-C-1-101-12-071	02/13/06	11/27/06	Subsurface	FD	mg/kg	**5.1**	J-	90.9	J-	NA		22.5	J-
WSS-C-1-101-12-130	02/14/06	08/30/07	Subsurface	REG	mg/kg	**2.5**	J-	39.8	J-	NA		10.7	J-
WSS-C-1-101-12-154A	02/15/06	08/30/07	Subsurface	REG	mg/kg	**0.61**	J	39.4		NA		11.0	
WSS-D-0-101-10-019	01/30/06	08/28/07	Surface	REG	mg/kg	**4.6**	J-	326	J-	NA		30.7	J-
WSS-D-0-101-10-023	01/30/06	02/02/06	Surface	REG	mg/kg	**3.8**		412		14,100		30.3	
WSS-D-0-101-12-008F	02/13/06	02/15/06	Surface	REG	mg/kg	**2.8**		571		16,500		21.7	
WSS-D-0-101-12-008J	02/13/06	08/29/07	Surface	REG	mg/kg	**5.1**	J-	519	J-	NA		30.7	J-
WSS-D-0-101-12-008K	02/13/06	08/29/07	Surface	REG	mg/kg	**4.1**	J-	800	J-	NA		36.4	J-
WSS-D-0-101-12-023A	02/13/06	02/15/06	Surface	REG	mg/kg	**4.3**		646		**25,500**		177	
WSS-D-0-101-12-071	02/13/06	11/27/06	Surface	REG	mg/kg	**4.2**	J-	73.9	J-	NA		14.4	J-
WSS-D-0-101-12-073	02/13/06	08/29/07	Surface	REG	mg/kg	**1.4**		191		NA		39.8	
WSS-D-0-101-12-075	02/13/06	08/29/07	Surface	REG	mg/kg	**3.0**		313		NA		72.7	
WSS-D-0-101-12-093	02/13/06	08/29/07	Surface	REG	mg/kg	**4.2**		393		NA		50.6	
WSS-D-0-101-12-094A	02/14/06	02/15/06	Surface	REG	mg/kg	**4.9**		802		18,400		99	
WSS-D-0-101-12-101C	02/13/06	08/30/07	Surface	REG	mg/kg	**5.1**	J-	521	J-	NA		92.0	J-
WSS-D-0-101-12-102	02/13/06	08/30/07	Surface	REG	mg/kg	**5.5**	J-	526	J-	NA		137	J-
WSS-D-0-101-12-108	02/14/06	08/30/07	Surface	REG	mg/kg	**5.6**	J-	691	J-	NA		53.0	J-
WSS-D-0-101-12-130	02/14/06	08/30/07	Surface	REG	mg/kg	**3.8**	J-	435	J-	NA		42.9	J-
WSS-D-0-101-12-136	02/14/06	08/30/07	Surface	REG	mg/kg	**3.3**	J-	368	J-	NA		57.5	J-
WSS-D-0-101-12-142	02/14/06	08/30/07	Surface	REG	mg/kg	**3.2**	J-	338	J-	NA		58.9	J-
WSS-D-0-101-12-147A	02/14/06	08/30/07	Surface	REG	mg/kg	**5.9**	J-	601	J-	NA		74.8	J-
WSS-D-0-101-12-149	02/14/06	08/30/07	Surface	REG	mg/kg	**9.4**	J-	824	J-	NA		64.1	J-

TABLE 4-11
Soil Sampling Laboratory Value Exceedances for Full Inorganic Target Analyte List
Winkelman Residential Properties
Remedial Investigation Report
ASARCO LLC Hayden, Arizona Plant Site

The data in this table are illustrated on figures 4-19, 4-21, and 4-23.

Arizona Residential Soil Remediation Level[1] (mg/kg):						**10**		**3,100**		**--**		**400**	
EPA Region IX Preliminary Remediation Goal[2] (mg/kg):						**0.39**		**3,100**		**23,000**		**400**	
Location/	**Sample**	**Shipment**		**Sample**		**Arsenic**		**Copper**		**Iron**		**Lead**	
Parcel ID	**Date**	**Date**	**Depth**	**Type**	**Units**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**
WSS-D-0-101-12-150	02/14/06	08/30/07	Surface	REG	mg/kg	**30.2**		**5,710**		NA		**673**	
WSS-D-0-101-12-154A	02/15/06	08/30/07	Surface	REG	mg/kg	**3.1**		293		NA		62.9	
WSS-D-0-101-12-155	02/15/06	08/30/07	Surface	REG	mg/kg	**0.63**	J-	266	J-	NA		35.5	J-
WSS-D-0-101-12-187	02/14/06	02/15/06	Surface	REG	mg/kg	**4.9**		324		15,800		56.9	
WSS-D-0-101-12-188B	02/14/06	08/31/07	Surface	REG	mg/kg	**4.8**	J-	489	J-	NA		47.4	J-
WSS-D-0-101-12-193	01/30/06	09/14/07	Surface	REG	mg/kg	**5.4**	J-	489	J-	NA		**3,330**	J-
WSS-D-0-101-12-204	02/15/06	08/31/07	Surface	REG	mg/kg	**6.2**	J-	290	J-	NA		27.6	J-
WSS-D-0-101-12-234	01/30/06	08/31/07	Surface	REG	mg/kg	**3.2**	J-	199	J-	NA		37.1	J-
WSS-D-0-101-12-236	02/14/06	02/15/06	Surface	REG	mg/kg	**6.6**		1,050		20,300		143	
WSS-D-0-101-12-236	02/14/06	09/14/07	Surface	REG	mg/kg	**7.3**	J-	971	J-	NA		126	J-
WSS-D-0-101-12-241	02/14/06	08/31/07	Surface	REG	mg/kg	**3.4**	J-	273	J-	NA		21.2	J-
WSS-D-0-101-12-267	02/14/06	02/15/06	Surface	REG	mg/kg	**6.7**		284		20,200		42.5	
WSS-D-0-101-12-267	02/14/06	09/14/07	Surface	REG	mg/kg	**6.5**	J-	328	J-	NA		45.6	J-
WSS-D-0-101-12-288	02/13/06	08/31/07	Surface	REG	mg/kg	**4.6**	J-	417	J-	NA		52.0	J-
WSS-D-1-101-12-108	02/14/06	08/30/07	Subsurface	REG	mg/kg	**3.9**	J-	239	J-	NA		52.1	J-
WSS-D-1-101-12-150	02/14/06	08/30/07	Subsurface	REG	mg/kg	**8.7**	J-	799	J-	NA		174	J-
WSS-D-1-101-12-155	02/15/06	08/30/07	Subsurface	REG	mg/kg	**0.42**	J-	117	J-	NA		35.4	J-
WSS-E-0-101-10-019	01/30/06	02/02/06	Surface	REG	mg/kg	**3.1**		377		13,100		18.5	
WSS-E-0-101-10-023	01/30/06	08/28/07	Surface	REG	mg/kg	**5.4**	J-	481	J-	NA		49.2	J-
WSS-E-0-101-12-008F	02/13/06	02/15/06	Surface	REG	mg/kg	**9**		1,110		17,300		99.9	
WSS-E-0-101-12-008J	02/13/06	08/29/07	Surface	REG	mg/kg	**7.9**	J-	130	J-	NA		35.3	J-
WSS-E-0-101-12-008K	02/13/06	08/29/07	Surface	REG	mg/kg	**3.2**	J-	259	J-	NA		19.7	J-

TABLE 4-11
Soil Sampling Laboratory Value Exceedances for Full Inorganic Target Analyte List
Winkelman Residential Properties
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ASARCO LLC Hayden, Arizona Plant Site

The data in this table are illustrated on figures 4-19, 4-21, and 4-23.

Arizona Residential Soil Remediation Level[1] (mg/kg):						**10**		**3,100**		**--**		**400**	
EPA Region IX Preliminary Remediation Goal[2] (mg/kg):						**0.39**		**3,100**		**23,000**		**400**	
Location/	**Sample**	**Shipment**		**Sample**		**Arsenic**		**Copper**		**Iron**		**Lead**	
Parcel ID	**Date**	**Date**	**Depth**	**Type**	**Units**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**
WSS-E-0-101-12-023A	02/13/06	08/29/07	Surface	REG	mg/kg	**4.2**	J-	76.9	J-	NA		15.5	J-
WSS-E-0-101-12-071	02/13/06	11/27/06	Surface	REG	mg/kg	**14.3**	J-	426	J-	NA		69.9	J-
WSS-E-0-101-12-073	02/13/06	08/29/07	Surface	REG	mg/kg	**3.0**		353		NA		87.7	
WSS-E-0-101-12-075	02/13/06	08/29/07	Surface	REG	mg/kg	**1.8**		547		NA		36.6	
WSS-E-0-101-12-093	02/13/06	08/29/07	Surface	REG	mg/kg	**3.1**		511		NA		66.6	
WSS-E-0-101-12-094A	02/14/06	02/15/06	Surface	REG	mg/kg	**2.7**		396		18,200		74.1	
WSS-E-0-101-12-101C	02/13/06	08/30/07	Surface	REG	mg/kg	**4.7**	J-	368	J-	NA		108	J-
WSS-E-0-101-12-102	02/13/06	08/30/07	Surface	REG	mg/kg	**5.3**	J-	360	J-	NA		96.0	J-
WSS-E-0-101-12-108	02/14/06	08/30/07	Surface	REG	mg/kg	**4.8**	J-	222	J-	NA		19.9	J-
WSS-E-0-101-12-130	02/14/06	08/30/07	Surface	REG	mg/kg	**2.4**	J-	322	J-	NA		31.4	J-
WSS-E-0-101-12-136	02/14/06	08/30/07	Surface	REG	mg/kg	**3.0**	J-	247	J-	NA		100	J-
WSS-E-0-101-12-142	02/14/06	08/30/07	Surface	REG	mg/kg	**8.4**	J-	1,150	J-	NA		162	J-
WSS-E-0-101-12-147A	02/14/06	08/30/07	Surface	REG	mg/kg	**2.9**	J-	141	J-	NA		32.0	J-
WSS-E-0-101-12-149	02/14/06	08/30/07	Surface	REG	mg/kg	**7.2**	J-	629	J-	NA		**2,330**	J-
WSS-E-0-101-12-150	02/14/06	08/30/07	Surface	REG	mg/kg	**52.0**		**6,790**		NA		**517**	
WSS-E-0-101-12-154A	02/15/06	08/30/07	Surface	REG	mg/kg	**2.9**		307		NA		83.7	
WSS-E-0-101-12-155	02/15/06	08/30/07	Surface	REG	mg/kg	**4.2**	J-	779	J-	NA		76.6	J-
WSS-E-0-101-12-187	02/14/06	08/31/07	Surface	REG	mg/kg	**1.7**	J-	288	J-	NA		69.8	J-
WSS-E-0-101-12-188B	02/14/06	02/15/06	Surface	REG	mg/kg	**3.5**		241		14,000		22.4	
WSS-E-0-101-12-188B	02/14/06	09/14/07	Surface	REG	mg/kg	**3.7**	J-	220	J-	NA		28.2	J-
WSS-E-0-101-12-193	01/30/06	09/14/07	Surface	REG	mg/kg	**6.6**	J-	1,070	J-	NA		**647**	J-
WSS-E-0-101-12-204	02/15/06	08/31/07	Surface	REG	mg/kg	**3.8**	J-	207	J-	NA		13.9	J-

TABLE 4-11
Soil Sampling Laboratory Value Exceedances for Full Inorganic Target Analyte List
Winkelman Residential Properties
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ASARCO LLC Hayden, Arizona Plant Site

The data in this table are illustrated on figures 4-19, 4-21, and 4-23.

Arizona Residential Soil Remediation Level[1] (mg/kg):						**10**		**3,100**		**--**		**400**	
EPA Region IX Preliminary Remediation Goal[2] (mg/kg):						**0.39**		**3,100**		**23,000**		**400**	
Location/	**Sample**	**Shipment**		**Sample**		**Arsenic**		**Copper**		**Iron**		**Lead**	
Parcel ID	**Date**	**Date**	**Depth**	**Type**	**Units**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**
WSS-E-0-101-12-234	01/30/06	08/31/07	Surface	REG	mg/kg	**3.5**	J-	94.0	J-	NA		25.1	J-
WSS-E-0-101-12-236	02/14/06	02/15/06	Surface	REG	mg/kg	**3.4**		176		17,800		17.5	
WSS-E-0-101-12-241	02/14/06	08/31/07	Surface	REG	mg/kg	**4.2**	J-	491	J-	NA		43.7	J-
WSS-E-0-101-12-267	02/14/06	08/31/07	Surface	REG	mg/kg	**4.9**	J-	370	J-	NA		40.2	J-
WSS-E-0-101-12-288	02/13/06	02/15/06	Surface	REG	mg/kg	**3.9**		291		16,000		42.7	
WSS-E-1-101-10-019	01/30/06	08/28/07	Subsurface	REG	mg/kg	**9.4**	J-	67.5	J-	NA		6.8	J-
WSS-E-1-101-12-008K	02/13/06	08/29/07	Subsurface	REG	mg/kg	**4.2**	J-	137	J-	NA		27.4	J-
WSS-E-1-101-12-147A	02/14/06	08/30/07	Subsurface	REG	mg/kg	**4.3**	J-	41.7	J-	NA		14.8	J-
WSS-F-0-101-10-019	01/30/06	08/28/07	Surface	REG	mg/kg	**3.9**	J-	391	J-	NA		19.0	J-
WSS-F-0-101-10-023	01/30/06	08/28/07	Surface	REG	mg/kg	**4.1**	J-	324	J-	NA		45.7	J-
WSS-F-0-101-12-008F	02/13/06	02/15/06	Surface	REG	mg/kg	**3.2**		553		16,800		47.6	
WSS-F-0-101-12-008J	02/13/06	08/29/07	Surface	REG	mg/kg	**14.6**	J-	356	J-	NA		88.8	J-
WSS-F-0-101-12-008K	02/13/06	08/29/07	Surface	REG	mg/kg	**3.5**	J-	281	J-	NA		27.5	J-
WSS-F-0-101-12-023A	02/13/06	08/29/07	Surface	REG	mg/kg	**6.2**	J-	378	J-	NA		191	J-
WSS-F-0-101-12-071	02/13/06	11/27/06	Surface	REG	mg/kg	**14.4**	J-	576	J-	NA		74.4	J-
WSS-F-0-101-12-073	02/13/06	02/15/06	Surface	REG	mg/kg	**5.1**		426		13,600		90.3	
WSS-F-0-101-12-073	02/13/06	09/14/07	Surface	REG	mg/kg	**5.4**	J-	389	J-	NA		93.5	J-
WSS-F-0-101-12-075	02/13/06	08/29/07	Surface	REG	mg/kg	**5.4**		758		NA		146	
WSS-F-0-101-12-093	02/13/06	08/29/07	Surface	REG	mg/kg	**6.4**	J-	637	J-	NA		53.5	J-
WSS-F-0-101-12-094A	02/14/06	02/15/06	Surface	REG	mg/kg	**4.9**		534		19,000		116	
WSS-F-0-101-12-101C	02/13/06	08/30/07	Surface	REG	mg/kg	**4.8**	J-	355	J-	NA		107	J-
WSS-F-0-101-12-102	02/13/06	08/30/07	Surface	REG	mg/kg	**5.8**	J-	698	J-	NA		180	J-
WSS-F-0-101-12-108	02/14/06	08/30/07	Surface	REG	mg/kg	**4.4**	J-	428	J-	NA		40.6	J-

TABLE 4-11
Soil Sampling Laboratory Value Exceedances for Full Inorganic Target Analyte List
Winkelman Residential Properties
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ASARCO LLC Hayden, Arizona Plant Site

The data in this table are illustrated on figures 4-19, 4-21, and 4-23.

Arizona Residential Soil Remediation Level[1] (mg/kg):						**10**		**3,100**		**--**		**400**	
EPA Region IX Preliminary Remediation Goal[2] (mg/kg):						**0.39**		**3,100**		**23,000**		**400**	
Location/	**Sample**	**Shipment**		**Sample**		**Arsenic**		**Copper**		**Iron**		**Lead**	
Parcel ID	**Date**	**Date**	**Depth**	**Type**	**Units**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**
WSS-F-0-101-12-130	02/14/06	08/30/07	Surface	REG	mg/kg	**6.8**	J-	930	J-	NA		124	J-
WSS-F-0-101-12-136	02/14/06	02/15/06	Surface	REG	mg/kg	**4.8**		243		16,900		53.5	
WSS-F-0-101-12-136	02/14/06	02/15/06	Surface	FD	mg/kg	**5.2**		243		17,000		50.1	
WSS-F-0-101-12-142	02/14/06	08/30/07	Surface	REG	mg/kg	**2.7**	J-	148	J-	NA		75.3	J-
WSS-F-0-101-12-147A	02/14/06	08/30/07	Surface	REG	mg/kg	**5.2**	J-	397	J-	NA		47.6	J-
WSS-F-0-101-12-149	02/14/06	08/30/07	Surface	REG	mg/kg	**4.0**	J-	383	J-	NA		35.9	J-
WSS-F-0-101-12-150	02/14/06	08/30/07	Surface	REG	mg/kg	**3.2**		703		NA		98.7	
WSS-F-0-101-12-154A	02/15/06	08/30/07	Surface	REG	mg/kg	**4.0**		361		NA		78.9	
WSS-F-0-101-12-155	02/15/06	08/30/07	Surface	REG	mg/kg	**2.4**	J-	196	J-	NA		40.1	J-
WSS-F-0-101-12-187	02/14/06	08/31/07	Surface	REG	mg/kg	**1.5**	J-	375	J-	NA		20.0	J-
WSS-F-0-101-12-188B	02/14/06	08/31/07	Surface	REG	mg/kg	**4.6**	J-	344	J-	NA		45.6	J-
WSS-F-0-101-12-193	01/30/06	09/14/07	Surface	REG	mg/kg	**4.1**	J-	176	J-	NA		54.9	J-
WSS-F-0-101-12-204	02/15/06	08/31/07	Surface	REG	mg/kg	**5.3**	J-	802	J-	NA		90.0	J-
WSS-F-0-101-12-234	01/30/06	08/31/07	Surface	REG	mg/kg	**4.5**	J-	123	J-	NA		274	J-
WSS-F-0-101-12-236	02/14/06	02/15/06	Surface	REG	mg/kg	**1.2**		81.3		21,700		9.4	
WSS-F-0-101-12-241	02/14/06	08/31/07	Surface	REG	mg/kg	**4.5**	J-	364	J-	NA		25.4	J-
WSS-F-0-101-12-267	02/14/06	08/31/07	Surface	REG	mg/kg	**3.3**	J-	141	J-	NA		42.4	J-
WSS-F-0-101-12-288	02/13/06	08/31/07	Surface	REG	mg/kg	**5.1**	J-	78.3	J-	NA		26.0	J-
WSS-F-1-101-12-101C	02/13/06	08/30/07	Subsurface	REG	mg/kg	**3.8**	J-	55.1	J-	NA		28.8	J-
WSS-F-1-101-12-188B	02/14/06	08/31/07	Subsurface	REG	mg/kg	**2.3**	J-	64.4	J-	NA		39.1	J-
WSS-F-1-101-12-234	01/30/06	08/31/07	Subsurface	REG	mg/kg	**4.3**	J-	23.2	J-	NA		21.5	J-
WSS-G-0-101-10-019	01/30/06	08/28/07	Surface	REG	mg/kg	**4.1**	J-	443	J-	NA		15.4	J-
WSS-G-0-101-10-023	01/30/06	08/28/07	Surface	REG	mg/kg	**5.1**		409		NA		41.5	

TABLE 4-11
Soil Sampling Laboratory Value Exceedances for Full Inorganic Target Analyte List
Winkelman Residential Properties
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ASARCO LLC Hayden, Arizona Plant Site

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Arizona Residential Soil Remediation Level[1] (mg/kg):						**10**		**3,100**		**--**		**400**	
EPA Region IX Preliminary Remediation Goal[2] (mg/kg):						**0.39**		**3,100**		**23,000**		**400**	
Location/	**Sample**	**Shipment**		**Sample**		**Arsenic**		**Copper**		**Iron**		**Lead**	
Parcel ID	**Date**	**Date**	**Depth**	**Type**	**Units**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**
WSS-G-0-101-12-008F	02/13/06	02/15/06	Surface	REG	mg/kg	**6.1**		486		17,200		57.3	
WSS-G-0-101-12-008J	02/13/06	08/29/07	Surface	REG	mg/kg	**28.0**	J-	297	J-	NA		239	J-
WSS-G-0-101-12-008K	02/13/06	08/29/07	Surface	REG	mg/kg	**3.1**	J-	172	J-	NA		21.8	J-
WSS-G-0-101-12-023A	02/13/06	08/29/07	Surface	REG	mg/kg	**3.6**	J-	226	J-	NA		98.2	J-
WSS-G-0-101-12-071	02/13/06	02/15/06	Surface	REG	mg/kg	**13.8**		442		15,000		59.3	
WSS-G-0-101-12-071	02/13/06	02/15/06	Surface	FD	mg/kg	**14.1**		444		15,600		60.7	
WSS-G-0-101-12-071	02/13/06	11/28/06	Surface	REG	mg/kg	**17.3**	J-	506	J-	NA		70.7	J-
WSS-G-0-101-12-071	02/13/06	09/14/07	Surface	REG	mg/kg	**14.6**	J-	431	J-	NA		62.3	J-
WSS-G-0-101-12-073	02/13/06	08/29/07	Surface	REG	mg/kg	**5.1**		507		NA		101	
WSS-G-0-101-12-075	02/13/06	08/29/07	Surface	REG	mg/kg	**3.3**		541		NA		54.9	
WSS-G-0-101-12-093	02/13/06	08/29/07	Surface	REG	mg/kg	**7.4**	J-	499	J-	NA		51.1	J-
WSS-G-0-101-12-094A	02/14/06	02/15/06	Surface	REG	mg/kg	**2.8**		321		13,400		21.1	
WSS-G-0-101-12-101C	02/13/06	08/30/07	Surface	REG	mg/kg	**10.0**	J-	419	J-	NA		**780**	J-
WSS-G-0-101-12-102	02/13/06	08/30/07	Surface	REG	mg/kg	**6.8**	J-	583	J-	NA		115	J-
WSS-G-0-101-12-108	02/14/06	08/30/07	Surface	REG	mg/kg	**4.1**	J-	199	J-	NA		19.7	J-
WSS-G-0-101-12-130	02/14/06	08/30/07	Surface	REG	mg/kg	**4.5**	J-	503	J-	NA		102	J-
WSS-G-0-101-12-136	02/14/06	08/30/07	Surface	REG	mg/kg	**4.5**	J-	262	J-	NA		42.7	J-
WSS-G-0-101-12-142	02/14/06	08/30/07	Surface	REG	mg/kg	**6.8**	J-	551	J-	NA		295	J-
WSS-G-0-101-12-147A	02/14/06	08/30/07	Surface	REG	mg/kg	**6.0**	J-	511	J-	NA		80.8	J-
WSS-G-0-101-12-149	02/14/06	08/30/07	Surface	REG	mg/kg	**11.3**	J-	1,730	J-	NA		88.5	J-
WSS-G-0-101-12-150	02/14/06	02/15/06	Surface	REG	mg/kg	**3.6**		595		14,400		53	
WSS-G-0-101-12-150	02/14/06	09/14/07	Surface	REG	mg/kg	**4.7**	J-	632	J-	NA		89.5	J-
WSS-G-0-101-12-154A	02/15/06	08/30/07	Surface	REG	mg/kg	**6.3**		1,070		NA		107	

TABLE 4-11
Soil Sampling Laboratory Value Exceedances for Full Inorganic Target Analyte List
Winkelman Residential Properties
Remedial Investigation Report
ASARCO LLC Hayden, Arizona Plant Site

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Arizona Residential Soil Remediation Level[1] (mg/kg):						**10**		**3,100**		**--**		**400**	
EPA Region IX Preliminary Remediation Goal[2] (mg/kg):						**0.39**		**3,100**		**23,000**		**400**	
Location/	**Sample**	**Shipment**		**Sample**		**Arsenic**		**Copper**		**Iron**		**Lead**	
Parcel ID	**Date**	**Date**	**Depth**	**Type**	**Units**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**
WSS-G-0-101-12-155	02/15/06	08/30/07	Surface	REG	mg/kg	**3.6**	J-	591	J-	NA		71.4	J-
WSS-G-0-101-12-187	02/14/06	08/31/07	Surface	REG	mg/kg	**2.1**	J-	199	J-	NA		39.0	J-
WSS-G-0-101-12-188B	02/14/06	08/31/07	Surface	REG	mg/kg	**3.5**	J-	165	J-	NA		20.2	J-
WSS-G-0-101-12-193	01/30/06	09/14/07	Surface	REG	mg/kg	**5.4**	J-	299	J-	NA		**428**	J-
WSS-G-0-101-12-204	02/15/06	08/31/07	Surface	REG	mg/kg	**5.1**	J-	386	J-	NA		58.2	J-
WSS-G-0-101-12-234	01/30/06	08/31/07	Surface	REG	mg/kg	**9.1**	J-	324	J-	NA		**430**	J-
WSS-G-0-101-12-236	02/14/06	02/15/06	Surface	REG	mg/kg	**3.3**		359		17,900		48	
WSS-G-0-101-12-241	02/14/06	08/31/07	Surface	REG	mg/kg	**3.6**	J-	144	J-	NA		18.1	J-
WSS-G-0-101-12-267	02/14/06	08/31/07	Surface	REG	mg/kg	**3.9**	J-	102	J-	NA		114	J-
WSS-G-0-101-12-288	02/13/06	08/31/07	Surface	REG	mg/kg	**3.4**	J-	375	J-	NA		**433**	J-
WSS-G-1-101-12-093	02/13/06	08/29/07	Subsurface	REG	mg/kg	**7.4**	J-	135	J-	NA		37.1	J-
WSS-G-1-101-12-142	02/14/06	08/30/07	Subsurface	REG	mg/kg	**3.8**	J-	44.2	J-	NA		34.7	J-
WSS-G-1-101-12-187	02/14/06	08/31/07	Subsurface	REG	mg/kg	**0.84**	J-	125	J-	NA		69.9	J-
WSS-G-1-101-12-204	02/15/06	08/31/07	Subsurface	REG	mg/kg	**4.1**	J-	134	J-	NA		37.4	J-
WSS-H-0-101-10-019	01/30/06	08/28/07	Surface	REG	mg/kg	**4.7**	J-	490	J-	NA		37.2	J-
WSS-H-0-101-10-023	01/30/06	08/28/07	Surface	REG	mg/kg	**6.8**		657		NA		52.6	
WSS-H-0-101-12-008F	02/13/06	02/15/06	Surface	REG	mg/kg	**2.3**		278		15,300		18.3	
WSS-H-0-101-12-008J	02/13/06	08/29/07	Surface	REG	mg/kg	**12.7**	J-	248	J-	NA		91.4	J-
WSS-H-0-101-12-008K	02/13/06	08/29/07	Surface	REG	mg/kg	**3.5**	J-	349	J-	NA		21.1	J-
WSS-H-0-101-12-023A	02/13/06	08/29/07	Surface	REG	mg/kg	**4.5**	J-	90.1	J-	NA		35.4	J-
WSS-H-0-101-12-071	02/13/06	11/27/06	Surface	REG	mg/kg	**10.3**	J-	332	J-	NA		76.5	J-
WSS-H-0-101-12-073	02/13/06	08/29/07	Surface	REG	mg/kg	**5.2**		677		NA		134	
WSS-H-0-101-12-075	02/13/06	02/15/06	Surface	REG	mg/kg	**2.5**		388		12,100		47	

TABLE 4-11
Soil Sampling Laboratory Value Exceedances for Full Inorganic Target Analyte List
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Arizona Residential Soil Remediation Level[1] (mg/kg):						**10**		**3,100**		**--**		**400**	
EPA Region IX Preliminary Remediation Goal[2] (mg/kg):						**0.39**		**3,100**		**23,000**		**400**	
Location/	**Sample**	**Shipment**		**Sample**		**Arsenic**		**Copper**		**Iron**		**Lead**	
Parcel ID	**Date**	**Date**	**Depth**	**Type**	**Units**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**
WSS-H-0-101-12-093	02/13/06	08/29/07	Surface	REG	mg/kg	**5.5**	J-	314	J-	NA		36.6	J-
WSS-H-0-101-12-094A	02/14/06	02/15/06	Surface	REG	mg/kg	**1.9**		208		13,900		37.2	
WSS-H-0-101-12-101C	02/13/06	08/30/07	Surface	REG	mg/kg	**5.4**	J-	265	J-	NA		239	J-
WSS-H-0-101-12-102	02/13/06	08/30/07	Surface	REG	mg/kg	**5.4**	J-	455	J-	NA		176	J-
WSS-H-0-101-12-108	02/14/06	08/30/07	Surface	REG	mg/kg	**4.7**	J-	489	J-	NA		127	J-
WSS-H-0-101-12-130	02/14/06	02/15/06	Surface	REG	mg/kg	**4.2**		819		16,200		51.3	
WSS-H-0-101-12-136	02/14/06	08/30/07	Surface	REG	mg/kg	**3.6**	J-	261	J-	NA		44.8	J-
WSS-H-0-101-12-142	02/14/06	08/30/07	Surface	REG	mg/kg	**13.1**	J-	1,510	J-	NA		297	J-
WSS-H-0-101-12-147A	02/14/06	08/30/07	Surface	REG	mg/kg	**4.3**	J-	579	J-	NA		92.7	J-
WSS-H-0-101-12-149	02/14/06	08/30/07	Surface	REG	mg/kg	**6.2**	J-	626	J-	NA		129	J-
WSS-H-0-101-12-150	02/14/06	08/30/07	Surface	REG	mg/kg	**4.7**		**5,680**		NA		59.5	
WSS-H-0-101-12-154A	02/15/06	08/30/07	Surface	REG	mg/kg	**2.7**		484		NA		102	
WSS-H-0-101-12-155	02/15/06	08/30/07	Surface	REG	mg/kg	**1.9**	J-	400	J-	NA		71.1	J-
WSS-H-0-101-12-187	02/14/06	08/31/07	Surface	REG	mg/kg	**0.78**	J-	431	J-	NA		47.1	J-
WSS-H-0-101-12-188B	02/14/06	08/31/07	Surface	REG	mg/kg	**3.6**	J-	359	J-	NA		30.8	J-
WSS-H-0-101-12-193	01/30/06	09/14/07	Surface	REG	mg/kg	**5.8**	J-	570	J-	NA		228	J-
WSS-H-0-101-12-204	02/15/06	08/31/07	Surface	REG	mg/kg	**6.4**	J-	382	J-	NA		41.1	J-
WSS-H-0-101-12-234	01/30/06	08/31/07	Surface	REG	mg/kg	**8.8**	J-	243	J-	NA		88.7	J-
WSS-H-0-101-12-236	02/14/06	02/15/06	Surface	REG	mg/kg	**5.1**		360		16,300		159	
WSS-H-0-101-12-241	02/14/06	08/31/07	Surface	REG	mg/kg	**3.6**	J-	189	J-	NA		20.9	J-
WSS-H-0-101-12-267	02/14/06	08/31/07	Surface	REG	mg/kg	**5.8**	J-	327	J-	NA		44.1	J-
WSS-H-0-101-12-288	02/13/06	08/31/07	Surface	REG	mg/kg	**4.1**	J-	380	J-	NA		59.6	J-
WSS-H-1-101-12-008J	02/13/06	08/29/07	Subsurface	REG	mg/kg	**12.3**	J-	131	J-	NA		229	J-

TABLE 4-11
Soil Sampling Laboratory Value Exceedances for Full Inorganic Target Analyte List
Winkelman Residential Properties
Remedial Investigation Report
ASARCO LLC Hayden, Arizona Plant Site

The data in this table are illustrated on figures 4-19, 4-21, and 4-23.

Arizona Residential Soil Remediation Level[1] (mg/kg):						**10**		**3,100**		**--**		**400**	
EPA Region IX Preliminary Remediation Goal[2] (mg/kg):						**0.39**		**3,100**		**23,000**		**400**	
Location/	**Sample**	**Shipment**		**Sample**		**Arsenic**		**Copper**		**Iron**		**Lead**	
Parcel ID	**Date**	**Date**	**Depth**	**Type**	**Units**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**
WSS-H-1-101-12-241	02/14/06	08/31/07	Subsurface	REG	mg/kg	**2.2**	J-	42.3	J-	NA		7.2	J-
WSS-I-0-101-10-019	01/30/06	08/28/07	Surface	REG	mg/kg	**4.5**	J-	383	J-	NA		27.4	J-
WSS-I-0-101-10-023	01/30/06	08/28/07	Surface	REG	mg/kg	**6.9**	J-	532	J-	NA		40.6	J-
WSS-I-0-101-12-008F	02/13/06	02/15/06	Surface	REG	mg/kg	**3.7**		462		17,100		34.8	
WSS-I-0-101-12-008J	02/13/06	08/29/07	Surface	REG	mg/kg	**9.6**	J-	168	J-	NA		42.7	J-
WSS-I-0-101-12-008K	02/13/06	08/29/07	Surface	REG	mg/kg	**4.3**	J-	589	J-	NA		20.9	J-
WSS-I-0-101-12-023A	02/13/06	08/29/07	Surface	REG	mg/kg	**3.0**	J-	140	J-	NA		24.5	J-
WSS-I-0-101-12-071	02/13/06	11/27/06	Surface	REG	mg/kg	**16**	J-	351	J-	NA		66	J-
WSS-I-0-101-12-073	02/13/06	08/29/07	Surface	REG	mg/kg	**3.0**		313		NA		58.1	
WSS-I-0-101-12-075	02/13/06	08/29/07	Surface	REG	mg/kg	**1.9**		248		NA		47.2	
WSS-I-0-101-12-093	02/13/06	08/29/07	Surface	REG	mg/kg	**5.5**	J-	460	J-	NA		78.0	J-
WSS-I-0-101-12-094A	02/14/06	02/15/06	Surface	REG	mg/kg	**6.4**		538		13,000		87	
WSS-I-0-101-12-101C	02/13/06	02/15/06	Surface	REG	mg/kg	**3.3**		284		13,600		80.2	
WSS-I-0-101-12-102	02/13/06	08/30/07	Surface	REG	mg/kg	**6.5**	J-	422	J-	NA		360	J-
WSS-I-0-101-12-108	02/14/06	08/30/07	Surface	REG	mg/kg	**7.8**	J-	479	J-	NA		128	J-
WSS-I-0-101-12-130	02/14/06	08/30/07	Surface	REG	mg/kg	**4.6**	J-	498	J-	NA		133	J-
WSS-I-0-101-12-136	02/14/06	08/30/07	Surface	REG	mg/kg	**4.5**	J-	620	J-	NA		50.1	J-
WSS-I-0-101-12-142	02/14/06	08/30/07	Surface	REG	mg/kg	**9.5**	J-	1,300	J-	NA		308	J-
WSS-I-0-101-12-147A	02/14/06	08/30/07	Surface	REG	mg/kg	**4.8**	J-	495	J-	NA		119	J-
WSS-I-0-101-12-149	02/14/06	02/15/06	Surface	REG	mg/kg	**8.3**		1,080		17,900		83	
WSS-I-0-101-12-150	02/14/06	08/30/07	Surface	REG	mg/kg	**6.2**		1,550		NA		110	
WSS-I-0-101-12-154A	02/15/06	08/30/07	Surface	REG	mg/kg	**2.8**		482		NA		100	
WSS-I-0-101-12-155	02/15/06	08/30/07	Surface	REG	mg/kg	**1.7**	J-	774	J-	NA		79.3	J-

TABLE 4-11
Soil Sampling Laboratory Value Exceedances for Full Inorganic Target Analyte List
Winkelman Residential Properties
Remedial Investigation Report
ASARCO LLC Hayden, Arizona Plant Site

The data in this table are illustrated on figures 4-19, 4-21, and 4-23.

Arizona Residential Soil Remediation Level[1] (mg/kg):						**10**		**3,100**		**--**		**400**	
EPA Region IX Preliminary Remediation Goal[2] (mg/kg):						**0.39**		**3,100**		**23,000**		**400**	
Location/	**Sample**	**Shipment**		**Sample**		**Arsenic**		**Copper**		**Iron**		**Lead**	
Parcel ID	**Date**	**Date**	**Depth**	**Type**	**Units**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**
WSS-I-0-101-12-187	02/14/06	08/31/07	Surface	REG	mg/kg	***1.0***	U	111	J-	NA		11.3	J-
WSS-I-0-101-12-188B	02/14/06	08/31/07	Surface	REG	mg/kg	**3.6**	J-	345	J-	NA		24.8	J-
WSS-I-0-101-12-193	01/30/06	09/14/07	Surface	REG	mg/kg	**4.6**	J-	354	J-	NA		74.5	J-
WSS-I-0-101-12-204	02/15/06	08/31/07	Surface	REG	mg/kg	**4.7**	J-	638	J-	NA		48.4	J-
WSS-I-0-101-12-234	01/30/06	08/31/07	Surface	REG	mg/kg	**4.7**	J-	301	J-	NA		170	J-
WSS-I-0-101-12-236	02/14/06	02/15/06	Surface	REG	mg/kg	**5.3**		633		17,000		92.9	
WSS-I-0-101-12-241	02/14/06	08/31/07	Surface	REG	mg/kg	**6.3**	J-	477	J-	NA		126	J-
WSS-I-0-101-12-267	02/14/06	08/31/07	Surface	REG	mg/kg	**9.0**	J-	303	J-	NA		39.8	J-
WSS-I-0-101-12-288	02/13/06	08/31/07	Surface	REG	mg/kg	**2.9**	J-	227	J-	NA		14.3	J-
WSS-I-1-101-10-023	01/30/06	08/28/07	Subsurface	REG	mg/kg	**3.9**	J-	124	J-	NA		22.3	J-
WSS-I-1-101-12-094A	02/14/06	08/30/07	Subsurface	REG	mg/kg	**3.5**	J-	31.7	J-	NA		34.5	J-
WSS-I-1-101-12-102	02/13/06	08/30/07	Subsurface	REG	mg/kg	**6.0**	J-	203	J-	NA		283	J-
WSS-I-1-101-12-149	02/14/06	08/30/07	Subsurface	REG	mg/kg	**2.8**	J-	54.6	J-	NA		14.3	J-
WSS-K-0-101-12-093	02/24/06	08/29/07	Surface	REG	mg/kg	**12.4**	J-	1,990	J-	NA		176	J-
WSS-K-0-101-12-094A	02/24/06	08/30/07	Surface	REG	mg/kg	**15.5**	J-	580	J-	NA		88.5	J-
WSS-K-0-101-12-130	02/24/06	08/30/07	Surface	REG	mg/kg	**5.5**	J-	924	J-	NA		57.0	J-
WSS-K-0-101-12-142	02/24/06	08/30/07	Surface	REG	mg/kg	**34.1**	J-	1,670	J-	NA		**502**	J-
WSS-K-0-101-12-149	02/24/06	08/30/07	Surface	REG	mg/kg	**82.7**	J-	**9,190**	J-	NA		**444**	J-
WSS-K-0-101-12-150	02/24/06	08/30/07	Surface	REG	mg/kg	**22.4**		**3,230**		NA		112	
WSS-L-0-101-12-093	02/24/06	02/24/06	Surface	REG	mg/kg	**7.7**		1,160		12,600		116	J
WSS-L-0-101-12-094A	02/24/06	08/30/07	Surface	REG	mg/kg	**9.2**	J-	1,050	J-	NA		108	J-
WSS-L-0-101-12-130	02/24/06	08/30/07	Surface	REG	mg/kg	**4.7**	J-	923	J-	NA		55.3	J-
WSS-L-0-101-12-142	02/24/06	08/30/07	Surface	REG	mg/kg	**9.7**	J-	1,200	J-	NA		263	J-

TABLE 4-11
Soil Sampling Laboratory Value Exceedances for Full Inorganic Target Analyte List
Winkelman Residential Properties
Remedial Investigation Report
ASARCO LLC Hayden, Arizona Plant Site

The data in this table are illustrated on figures 4-19, 4-21, and 4-23.

Arizona Residential Soil Remediation Level[1] (mg/kg):						**10**		**3,100**		**--**		**400**	
EPA Region IX Preliminary Remediation Goal[2] (mg/kg):						**0.39**		**3,100**		**23,000**		**400**	
Location/	**Sample**	**Shipment**		**Sample**		**Arsenic**		**Copper**		**Iron**		**Lead**	
Parcel ID	**Date**	**Date**	**Depth**	**Type**	**Units**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**
WSS-L-0-101-12-149	02/24/06	08/30/07	Surface	REG	mg/kg	**22.3**	J-	3,000	J-	NA		161	J-
WSS-L-0-101-12-150	02/24/06	08/30/07	Surface	REG	mg/kg	**55.9**		**4,720**		NA		**1,160**	
Minimum Detected Result:						**0.42**		23.2		12,100		6.8	
Maximum Detected Result:						**165**		**9,190**		**25,500**		**3,330**	
Arithmetic Mean Detected Result:						**7.03**		559.25		16,185.00		126.48	

Table Notes:

[1] Arizona Department of Environmental Quality Residential Soil Remediation Levels, Title 18 Chapter 7, January 2008
[2] EPA Region IX Preliminary Remediation Goals, Residential Soil, October 2004
[3] Bold values with bold outline exceed one or more of the comparison criteria.
[4] Bold italicized values have detection limits above one or more of the comparison criteria.
[5] -- = Not established
[6] FD = Field duplicate
[7] J = Estimated value
[8] J- = Estimated value, may be biased low
[9] mg/kg = milligrams per kilogram
[10] NA = Not analyzed
[11] REG = Regular sample
[12] Subsurface = The sample was collected approximately 10-12 inches below surface.
[13] Surface = The sample was collected approximately 0-2 inches below surface.
[14] U = Not detected; reporting limit is shown in place of a result.

TABLE 4-12
Surface Water Sampling Laboratory Values for General and Field Parameters
Gila River and San Pedro River
Remedial Investigation Report
ASARCO LLC Hayden, Arizona Plant Site

The data in this table are illustrated on figures 4-24, 4-25, and 4-26.

	Location:	Arizona Aquatic & Wildlife Water Quality Criteria[1]	EPA Region IX Preliminary Remediation Goal[2]	GR-SW-01						GR-SW-02						GR-SW-03				GR-SW-04			
	Event:			Winter		Winter (Duplicate)		Summer		Winter		Summer		Summer (Duplicate)		Winter		Summer		Winter		Summer	
	Date:			3/7/06		3/7/06		8/22/06		3/7/06		8/22/06		8/22/06		3/7/06		8/22/06		3/8/06		8/22/06	
Parameter	**Units**			**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**
General Parameters:																							
Ammonia	mg/L	1.09	--	0.3	U	0.3	U	0.3	U	0.3	U	0.3	U	0.3	U	0.3	U	0.3	U	0.3	U	0.3	U
Bicarbonate Alkalinity	mg/L	--	--	180		180		140		180		140		140		180		140		180		140	
Carbonate Alkalinity	mg/L	--	--	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U
Hydroxide Alkalinity	mg/L	--	--	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U
Total Alkalinity	mg/L	--	--	180		180		140		180		140		140		180		140		180		140	
Total Dissolved Solids	mg/L	--	--	570		560		430		560		430		430		560		440		570		440	
Total Organic Carbon	mg/L	--	--	7.1		6.7		7.7		6.7		8		8.3		6.4		8		6.3		7.7	
Total Suspended Solids	mg/L	--	--	12		13		160		10		140		150		14		140		8	J	120	
Field Parameters:																							
pH		--	--	7.86		NA		7.26		7.99		7.99		NA		8.00		8.08		6.51		8.11	
Conductivity	mS/cm	--	--	1.07		NA		1.02		1.04		1.02		NA		1.01		0.98		1.05		1.02	
Turbidity	NTU	--	--	158		NA			U	125			U	NA		120			U	14			U
Dissolved Oxygen	mg/L	--	--	11.57		NA		8.69		11.12		8.58		NA		11.01		8.63		11.40		8.68	
Temperature	°C	--	--	16.9		NA		26.0		17.1		26.4		NA		17.0		26.3		11.8		25.9	

TABLE 4-12
Surface Water Sampling Laboratory Values for General and Field Parameters
Gila River and San Pedro River
Remedial Investigation Report
ASARCO LLC Hayden, Arizona Plant Site

The data in this table are illustrated on figures 4-24, 4-25, and 4-26.

	Location:	Arizona Aquatic & Wildlife Water Quality Criteria[1]	EPA Region IX Preliminary Remediation Goal[2]	GR-SW-05						GR-SW-06				GR-SW-07						GR-SW-08				GR-SW-09			
	Event:			Winter		Winter (Duplicate)		Summer		Winter		Summer		Winter		Summer		Summer (Duplicate)		Winter		Summer		Winter		Summer	
	Date:			3/8/06		3/8/06		8/22/06		3/8/06		8/23/06		3/8/06		8/23/06		8/23/06		3/8/06		8/23/06		3/8/06		8/23/06	
Parameter	**Units**			**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**
General Parameters:																											
Ammonia	mg/L	1.09	--	0.3	U	0.3	U	0.3	U	0.3	U	0.3	U	0.3	U	0.3	U	0.3	U	0.3	U	0.3	U	0.3	U	0.3	U
Bicarbonate Alkalinity	mg/L	--	--	180		180		150		180		940		180		580		500		180		200		180		170	
Carbonate Alkalinity	mg/L	--	--	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U
Hydroxide Alkalinity	mg/L	--	--	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U
Total Alkalinity	mg/L	--	--	180		180		150		180		940		190		580		500		190		200		190		170	
Total Dissolved Solids	mg/L	--	--	560		570		440		570		480		570		780		890		610		560		620		540	
Total Organic Carbon	mg/L	--	--	6.2		6.2		7.6		6.7		9		6.3		8.8		9		6.2		7.4		6.3		7.4	
Total Suspended Solids	mg/L	--	--	8	J	5	J	190		13		5,700		12		3,700		3,600		10		530		13		190	
Field Parameters:																											
pH		--	--	8.09		NA		7.93		8.07		8.12		8.05		8.07		NA		8.04		8.06		8.06		7.95	
Conductivity	mS/cm	--	--	0.99		NA		1.03		0.96		1.30		0.95		1.38		NA		1.00		1.47		1.02		1.41	
Turbidity	NTU	--	--	310		NA			U	174			U	126			U	NA		176			U	153			U
Dissolved Oxygen	mg/L	--	--	12.66		NA		8.71		11.73		9.64		12.46		9.82		NA		11.61		8.52		10.91		8.69	
Temperature	°C	--	--	16.0		NA		25.7		15.8		28.1		17.0		27.1		NA		15.2		27.5		14.8		26.9	

TABLE 4-12
Surface Water Sampling Laboratory Values for General and Field Parameters
Gila River and San Pedro River
Remedial Investigation Report
ASARCO LLC Hayden, Arizona Plant Site

The data in this table are illustrated on figures 4-24, 4-25, and 4-26.

	Location:	Arizona Aquatic & Wildlife Water Quality Criteria[1]	EPA Region IX Preliminary Remediation Goal[2]	GR-SW-10				GR-SW-11				SPR-SW-01				SPR-SW-02			
	Event:			Winter		Summer		Winter		Summer		Winter		Summer		Winter		Summer	
	Date:			3/8/06		8/23/06		3/8/06		8/22/06		3/8/06		8/22/06		3/8/06		8/22/06	
Parameter	**Units**			**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**
General Parameters:																			
Ammonia	mg/L	1.09	--	0.3	U	0.3	U	0.3	U	0.3	U	0.3	U	0.3	U	0.3	U	0.3	U
Bicarbonate Alkalinity	mg/L	--	--	180		170		180		170		270		300		270		310	
Carbonate Alkalinity	mg/L	--	--	5.9	J	10	U	10	U	10	U	10	U	10	U	10	U	10	U
Hydroxide Alkalinity	mg/L	--	--	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U
Total Alkalinity	mg/L	--	--	190		170		190		170		270		300		270		310	
Total Dissolved Solids	mg/L	--	--	620		560		620		560		980		920		980		940	
Total Organic Carbon	mg/L	--	--	6.2		7.4		6.2		7.5		1.6	J	3.9		1.7	J	3.9	
Total Suspended Solids	mg/L	--	--	13		270		15		340		5	J	460		10	U	600	
Field Parameters:																			
pH		--	--	8.09		7.34		8.11		8.03		7.79		8.00		7.81		7.99	
Conductivity	mS/cm	--	--	1.02		1.47		1.03		1.19		1.33		1.71		1.37		1.76	
Turbidity	NTU	--	--	174			U	121			U	165			U	169			U
Dissolved Oxygen	mg/L	--	--	10.35		8.53		10.96		8.81		12.47		8.99		11.12		8.92	
Temperature	°C	--	--	15.3		28.2		15.1		32.7		14.0		25.7		17.5		31.6	

Table Notes:

[1] Arizona Department of Environmental Quality Aquatic & Wildlife Water Quality Criteria, Title 18 Chapter 11, March 2003
[2] EPA Region IX Preliminary Remediation Goals, Tap Water, October 2004
[3] -- = Not established
[4] °C = Degrees Celsius
[5] J = Estimated value
[6] mg/L = milligrams per Liter
[7] mS/cm = millisiemens per centimeter
[8] NA = Not analyzed
[11] NTU = Nephelometric Turbidity Unit
[12] U = Not detected; reporting limit is shown in place of a result.

TABLE 4-13
Surface Water Sampling Laboratory Values for Inorganic Parameters
Gila River and San Pedro River
Remedial Investigation Report
ASARCO LLC Hayden, Arizona Plant Site

The data in this table are illustrated on figures 4-24, 4-25, 4-27, 4-28, 4-29, 4-30, 4-31, 4-32, 4-33, and 4-34.

	Location:	Arizona Aquatic & Wildlife Water Quality Criteria[1]	EPA Region IX Preliminary Remediation Goal[2]	GR-SW-01						GR-SW-02						GR-SW-03				GR-SW-04			
	Event:			Winter		Winter (Duplicate)		Summer		Winter		Summer		Summer (Duplicate)		Winter		Summer		Winter		Summer	
	Date:			3/7/06		3/7/06		8/22/06		3/7/06		8/22/06		8/22/06		3/7/06		8/22/06		3/8/06		8/22/06	
Parameter	Units			Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual
Aluminum	µg/L	--	36,000	738		869		5,010	J+	904		4,790	J+	4,390	J+	816		4,250	J+	944		4,100	J+
Antimony	µg/L	--	15	0.32	U	0.18	U	0.26	UJ	0.21	U	0.24	UJ	0.23	UJ	0.40	U	0.25	UJ	0.25	U	0.27	UJ
Arsenic	µg/L	--	0.045	**3.0**		**2.8**		**6.8**		**3.0**		**6.9**		**7.0**		**2.9**		**6.8**		**2.8**		**6.8**	
Barium	µg/L	--	2,600	63.6		63.0		115		63.0		112		118		61.5		109		64.5		105	
Beryllium	µg/L	--	73	0.66	U	0.66	U	0.18	J	0.66	U	0.25	J	0.19	J	0.66	U	0.22	J	0.66	U	0.22	J
Boron	µg/L	--	7,300	129		126		114		128		119		116		125		116		131		113	
Cadmium	µg/L	--	18	0.25	U	0.25	U	0.10	J	0.25	U	0.10	J	0.15	J	0.25	U	0.10	J	0.25	U	0.12	J
Calcium	µg/L	--	--	58,800		60,500		48,600		58,400		48,700		49,800		58,200		47,600		58,400		46,400	
Chromium	µg/L	--	--	0.52	J	0.57	J	2.7		0.61	J	2.7		2.5		0.61	J	2.5		0.66	J	2.5	
Cobalt	µg/L	--	730	0.50	J	0.49	J	2.7		0.46	J	2.6		2.9		0.49	J	2.5		0.44	J	2.4	
Copper	µg/L	--	1,500	4.9		4.1		15.4		5.4		15.8		21.8		6.0		16.4		4.5		16.8	
Cyanide	µg/L	9.7	730	***10***	U	***10***	U	6.1		***10***	U	4.8	UJ	5.0	UJ	***10***	U	4.6	UJ	***10***	U	3.8	UJ
Iron	µg/L	--	11,000	505		597		3,010		581		2,940		2,960		527		2,760		580		2,670	
Lead	µg/L	--	--	0.70	J	0.70	J	4.3		0.68	J	4.1		4.6		0.72	J	4.0		0.66	J	3.9	
Magnesium	µg/L	--	--	17,100		17,700		14,000		17,100		14,200		14,200		16,900		13,700		17,000		13,500	
Manganese	µg/L	--	880	105		104		301	J-	97.9		293	J-	335	J-	97.4		291	J-	89.8		284	J-
Mercury	µg/L	--	11	0.20	U	0.20	U	0.20	U	0.20	U	0.20	U	0.20	U	0.20	U	0.20	U	0.20	U	0.20	U
Molybdenum	µg/L	--	180	4.3	J	4.3	J	3.3		4.4	J	3.3		3.1		4.4	J	3.3		4.6	J	3.3	
Nickel	µg/L	--	730	2.1		2.0		6.6		2.1		6.6		7.0		2.0		6.6		2.1		6.2	
Potassium	µg/L	--	--	4,840	J	5,160	J	6,400	J	4,960	J	6,720	J	6,510	J	4,790	J	6,440	J	4,890	J	6,320	J
Selenium	µg/L	2	180	0.53	J	0.49	J	0.63	J	0.45	J	0.61	J	0.64	J	0.38	J	0.53	J	0.54	J	0.54	J
Silver	µg/L	--	180	0.36	U	0.36	U	0.040	UJ	0.36	U	0.030	UJ	0.030	UJ	0.080	J	0.020	UJ	0.36	U	0.030	UJ
Sodium	µg/L	--	--	126,999		129,999		94,800		126,000		98,100		96,100		126,000		97,200		126,999		94,100	
Thallium	µg/L	--	2.4	1.0	U	1.0	U	0.060	UJ	1.0	U	0.050	UJ	0.050	UJ	1.0	U	0.050	UJ	1.0	U	0.060	J
Vanadium	µg/L	--	36	6.2	J	6.2	J	15.1		6.2	J	14.8		15.5		6.1	J	14.6		5.9	J	14.5	
Zinc	µg/L	--	11,000	2.2		2.5		14.2		2.4		17.6		18.9		2.5		11.6		4.5		11.3	
Dissolved Aluminum	µg/L	--	36,000	21.6	J	20.1	J	4.3	J	87	U	28.3	J	84.3	J	28	J	11.1	J	22.8	J	4	J
Dissolved Antimony	µg/L	30	15	0.36	UJ	0.21	UJ	0.26	U	0.38	UJ	0.22	U	0.24	U	0.27	UJ	0.24	U	0.37	UJ	0.28	U
Dissolved Arsenic	µg/L	190	0.045	**2.5**		**2.6**		**7**		**2.7**		**5.6**		**6.5**		**2.7**		**6.3**		**2.5**		**6**	
Dissolved Barium	µg/L	--	2,600	54.1		54.8		69		54.5		56.8		70.2		55.6		64.8		52.4		63.1	
Dissolved Beryllium	µg/L	5.3	73	0.66	U	0.66	U	0.02	J	0.66	U	0.66	U	0.02	J	0.66	U	0.03	J	0.66	U	0.02	J
Dissolved Boron	µg/L	--	7,300	NA		NA		115		NA		111		113		NA		119		NA		112	
Dissolved Cadmium	µg/L	4.1	18	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U
Dissolved Calcium	µg/L	--	--	57,600		57,700		36,700		57,300		37,400		38,100		57,700		36,500		57,200		37,200	
Dissolved Chromium	µg/L	--	--	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U	2	U
Dissolved Cobalt	µg/L	--	730	2.3		0.37	J	0.32	J	1	U	0.3	J	0.38	J	2.1		0.31	J	3		0.3	J
Dissolved Copper	µg/L	18	1,500	2.2		3		0.61	J	2.1		2.6		1.1	J	7.3		1.1	J	2.8		0.82	J
Dissolved Iron	µg/L	--	11,000	300	U	300	U	254	J	300	U	243	J	370	J	300	U	260	J	300	U	233	J
Dissolved Lead	µg/L	6	--	1	U	1	U	0.16	J	1	U	0.07	J	0.22	J	1	U	0.21	J	1	U	0.06	J

TABLE 4-13
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	Location:	Arizona Aquatic & Wildlife Water Quality Criteria[1]	EPA Region IX Preliminary Remediation Goal[2]	GR-SW-01						GR-SW-02						GR-SW-03				GR-SW-04			
	Event:			Winter		Winter (Duplicate)		Summer		Winter		Summer		Summer (Duplicate)		Winter		Summer		Winter		Summer	
	Date:			3/7/06		3/7/06		8/22/06		3/7/06		8/22/06		8/22/06		3/7/06		8/22/06		3/8/06		8/22/06	
Parameter	**Units**			**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**
Dissolved Magnesium	µg/L	--	--	16,600		16,700		11,900		16,500		12,100		12,200		16,600		11,900		16,500		12,000	
Dissolved Manganese	µg/L	--	880	19.3		15.6		6.2		11.6		12.9		20.5		15.2		5.7		18.3		4.4	
Dissolved Mercury	µg/L	0.01	11	***0.043***	UJ	***0.048***	UJ	***0.2***	U	***0.048***	UJ	***0.2***	U	***0.2***	U	***0.042***	UJ	***0.2***	U	***0.2***	U	***0.2***	U
Dissolved Molybdenum	µg/L	--	180	4.5		4.6		4.4	J	4.8		3.9	J	4.2	J	4.9		4.4	J	4.5		4.1	J
Dissolved Nickel	µg/L	104	730	1.6		1.2		2.8	J	1.1		2.3	J	2.8	J	1.5		2.8	J	1.6		2.6	J
Dissolved Potassium	µg/L	--	--	5,090	J	5,130	J	5,500	J	5,050	J	5,320	J	5,490	J	5,140	J	5,500	J	5,100	J	5,250	J
Dissolved Selenium	µg/L	--	180	5	U	0.3	J	3.9	J	0.33	J	0.76	J	0.76	J	0.26	J	0.85	J	0.3	J	0.82	J
Dissolved Silver	µg/L	14	180	0.36	U	0.36	U	0.36	U	0.36	U	0.36	U	0.36	U	0.36	U	0.36	U	0.36	U	0.36	U
Dissolved Sodium	µg/L	--	--	123,999		125,000		87,400		123,999		88,400		89,300		126,000		87,900		123,999		87,400	
Dissolved Thallium	µg/L	150	2.4	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Dissolved Vanadium	µg/L	--	36	5		5.1		9.7		5.1		8.9		10.2		5.2		9.8		4.4		9.6	
Dissolved Zinc	µg/L	235	11,000	3.3		0.65	J	2.1	J	0.66	J	4.3	J	25.6	J	2.8		19.1	J	1.1	J	16.3	J

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	Location:	Arizona Aquatic & Wildlife Water Quality Criteria[1]	EPA Region IX Preliminary Remediation Goal[2]	GR-SW-05						GR-SW-06				GR-SW-07						GR-SW-08			
	Event:			Winter		Winter (Duplicate)		Summer		Winter		Summer		Winter		Summer		Summer (Duplicate)		Winter		Summer	
	Date:			3/8/06		3/8/06		8/22/06		3/8/06		8/23/06		3/8/06		8/23/06		8/23/06		3/8/06		8/23/06	
Parameter	Units			Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual
Aluminum	µg/L	--	36,000	1,030		1,020		5,000	J+	821		**62,000**	J+	754		**51,900**	J+	**52,800**	J+	1,090		12,000	J+
Antimony	µg/L	--	15	0.13	U	0.13	U	0.24	UJ	0.10	U	0.18	UJ	0.080	U	0.18	UJ	0.17	UJ	1.6	U	0.28	UJ
Arsenic	µg/L	--	0.045	**2.8**		**2.9**		**6.9**		**2.9**		**16.8**		**2.7**		**13.6**		**13.9**		**3.0**		**7.7**	
Barium	µg/L	--	2,600	62.5		65.9		118		62.0		1,190		64.5		893		833		65.7		230	
Beryllium	µg/L	--	73	0.66	U	0.66	U	0.31	J	0.66	U	8.3		0.66	U	5.3		4.8		0.090	J	0.81	J
Boron	µg/L	--	7,300	124		133		113		124		140		130		132		128		130		127	
Cadmium	µg/L	--	18	0.25	U	0.25	U	0.13	J	0.25	U	3.4		0.25	U	2.1		2.1		0.25	U	0.32	J
Calcium	µg/L	--	--	58,800		59,400		48,500		56,500		381,999		59,200		263,000		258,999		63,400		90,100	
Chromium	µg/L	--	--	0.67	J	0.71	J	3.0		0.59	J	31.4		0.55	J	24.5		25.3		0.80	J	6.4	
Cobalt	µg/L	--	730	0.45	J	0.48	J	2.8		0.43	J	39.2		0.45	J	27.7		26.9		0.53	J	5.6	
Copper	µg/L	--	1,500	5.6		5.3		18.6		6.5		172		6.8		137		130		5.4		37.0	
Cyanide	µg/L	9.7	730	***10***	U	***10***	U	4.6	UJ	***10***	U	4.4	UJ	***10***	U	4.9	UJ	**16.2**		***10***	U	***10.0***	U
Iron	µg/L	--	11,000	628		664		3,280		545		**34,500**		507		**29,800**		**31,500**		718		7,110	
Lead	µg/L	--	--	0.68	J	0.72	J	6.2		0.72	J	163		1.0		124		117		0.87	J	18.5	
Magnesium	µg/L	--	--	17,100		17,300		14,100		16,400		42,800		17,200		44,900		37,700		18,300		21,300	
Manganese	µg/L	--	880	81.3		86.4		314	J-	80.5		**3,540**	J-	94.1		**2,510**	J-	**2,420**	J-	139		561	J-
Mercury	µg/L	--	11	0.20	U	0.20	U	0.20	U	0.20	U	0.42		0.20	U	0.32		0.32		0.20	U	0.034	
Molybdenum	µg/L	--	180	4.3	J	4.6	J	2.9		4.4	J	0.33		4.6	J	0.36		0.90		5.3	J	3.6	
Nickel	µg/L	--	730	2.0		2.0		7.2		1.9		50.1		1.9		38.0		37.2		2.3		10.9	
Potassium	µg/L	--	--	4,850	J	4,910	J	6,650	J	4,670	J	21,200	J	4,980	J	22,300	J	19,100	J	4,980	J	9,360	J
Selenium	µg/L	2	180	0.49	J	0.42	J	0.52	J	0.38	J	**2.0**	J	0.39	J	1.4	J	1.7	J	0.90	J	0.80	J
Silver	µg/L	--	180	0.36	U	0.36	U	0.030	UJ	0.060	J	0.77	UJ	0.36	U	0.61	UJ	0.60	UJ	0.36	U	0.10	UJ
Sodium	µg/L	--	--	126,999		126,999		94,400		122,000		93,900		126,999		102,000		104,000		126,999		108,999	
Thallium	µg/L	--	2.4	1.0	U	1.0	U	0.060	J	1.0	U	0.86	J	1.0	U	0.68	J	0.67	J	1.0	U	0.17	J
Vanadium	µg/L	--	36	5.6	J	6.1	J	15.5		5.7	J	**56.6**		5.9	J	**49.2**		**47.9**		6.0	J	20.9	
Zinc	µg/L	--	11,000	3.2		3.1		16.5		2.8		237		3.0		179		178		3.6		41.6	
Dissolved Aluminum	µg/L	--	36,000	16.5	J	18.8	J	3.5	J	23.3	J	8,200		30.2		6,760		7,030		20.3	J	6.9	J
Dissolved Antimony	µg/L	30	15	0.11	UJ	0.2	UJ	0.24	U	0.55	UJ	0.28	U	0.43	UJ	0.3	U	0.31	U	1.2	UJ	0.26	U
Dissolved Arsenic	µg/L	190	0.045	**2.4**		**2.5**		**6.1**		**2.5**		**9.8**		**2.4**		**8.3**		**7.9**		**2.9**		**6.3**	
Dissolved Barium	µg/L	--	2,600	53.5		56.1		66.8		53.7		298		52.4		245		169		58.3		88.2	
Dissolved Beryllium	µg/L	5.3	73	0.66	U	0.66	U	0.03	J	0.66	U	1.3	J	0.66	U	0.94		0.55	J	0.66	U	0.66	U
Dissolved Boron	µg/L	--	7,300	NA		NA		113		NA		127		NA		121		126		NA		128	
Dissolved Cadmium	µg/L	4.1	18	0.25	U	0.25	U	0.25	U	0.25	U	0.42	J	0.25	U	0.32		0.17	J	0.25	U	0.25	U
Dissolved Calcium	µg/L	--	--	56,100		57,500		36,900		56,600		91,200		54,500		80,700		69,200		64,700		58,100	
Dissolved Chromium	µg/L	--	--	2	U	2	U	2	U	2	U	9.8		2	U	6.7		4		0.17	UJ	2	U
Dissolved Cobalt	µg/L	--	730	0.32	J	3.5		0.3	J	2.9		8		3.1		5.4		3		0.18	J	0.34	J
Dissolved Copper	µg/L	18	1,500	3.7		2.9		2.4		2.5		**43.5**		2.4		**29.9**		**22.7**		2.8		2.5	
Dissolved Iron	µg/L	--	11,000	300	U	300	U	222	J	300	U	5,840	J	300	U	8,160	J	5,020	J	300	U	368	J
Dissolved Lead	µg/L	6	--	1	U	1	U	0.06	J	1	U	**27.7**		1	U	**20.6**		**11.7**		1	U	0.2	J

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	Location:	Arizona Aquatic & Wildlife Water Quality Criteria[1]	EPA Region IX Preliminary Remediation Goal[2]	GR-SW-05						GR-SW-06				GR-SW-07						GR-SW-08			
	Event:			Winter		Winter (Duplicate)		Summer		Winter		Summer		Winter		Summer		Summer (Duplicate)		Winter		Summer	
	Date:			3/8/06		3/8/06		8/22/06		3/8/06		8/23/06		3/8/06		8/23/06		8/23/06		3/8/06		8/23/06	
Parameter	**Units**			**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**
Dissolved Magnesium	µg/L	--	--	16,200		16,500		11,900		16,300		21,100		15,600		18,900		17,800		18,300		16,100	
Dissolved Manganese	µg/L	--	880	7		13		15.3		11.8		613		20.9		394		238		59.3		18.5	
Dissolved Mercury	µg/L	0.01	11	***0.044***	UJ	***0.047***	UJ	***0.2***	U	***0.042***	UJ	**0.076**	J	***0.2***	U	**0.068**	J	**0.035**	J	***0.038***	UJ	***0.2***	U
Dissolved Molybdenum	µg/L	--	180	4.6		4.7		4.3	J	4.7		1.2	J	4.7		3.9	J	5.2	J	5.8		7	J
Dissolved Nickel	µg/L	104	730	1.2		1.4		2.5	J	1.7		13	J	1.5		9.2	J	6.7	J	1.3		2.6	J
Dissolved Potassium	µg/L	--	--	4,980	UJ	5,060	J	5,460	J	5,040	J	10,900	J	4,830	J	9,240	J	8,820	J	5,260	J	6,100	J
Dissolved Selenium	µg/L	--	180	5	U	0.2	J	0.72	J	0.3	J	1.3	J	0.25	J	2.2	J	1.6	J	0.43	J	1.1	J
Dissolved Silver	µg/L	14	180	0.36	U	0.36	U	0.36	U	0.36	U	0.06	J	0.36	U	0.05	J	0.36	U	0.36	U	0.36	U
Dissolved Sodium	µg/L	--	--	122,000		123,999		86,800		122,000		92,100		117,999		97,500		101,000		129,000		102,000	
Dissolved Thallium	µg/L	150	2.4	1	U	1	U	1	U	1	U	0.94		1	U	0.15	J	0.08	J	1	U	1	U
Dissolved Vanadium	µg/L	--	36	4.6		4.6		10.7		4.6		27.6		4.3		20.1		16.8		5.1		9.9	
Dissolved Zinc	µg/L	235	11,000	0.96	J	1.8	J	4.4	J	1.4	UJ	68.5	J	1.2	UJ	48.9	J	28.7	J	0.67	J	2.8	J

TABLE 4-13
Surface Water Sampling Laboratory Values for Inorganic Parameters
Gila River and San Pedro River
Remedial Investigation Report
ASARCO LLC Hayden, Arizona Plant Site

The data in this table are illustrated on figures 4-24, 4-25, 4-27, 4-28, 4-29, 4-30, 4-31, 4-32, 4-33, and 4-34.

	Location:	Arizona Aquatic & Wildlife Water Quality Criteria[1]	EPA Region IX Preliminary Remediation Goal[2]	GR-SW-09				GR-SW-10				GR-SW-11				SPR-SW-01				SPR-SW-02			
	Event:			Winter		Summer		Winter		Summer		Winter		Summer		Winter		Summer		Winter		Summer	
	Date:			3/8/06		8/23/06		3/8/06		8/23/06		3/8/06		8/22/06		3/8/06		8/22/06		3/8/06		8/22/06	
Parameter	Units			Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual
Aluminum	µg/L	--	36,000	1,040		4,380	J+	981		6,630	J+	1,090		7,010		765		3,130	J+	64.5	J	3,660	J+
Antimony	µg/L	--	15	0.090	U	0.27	UJ	0.050	U	0.24	UJ	0.40	U	0.27	UJ	0.27	U	0.31	UJ	0.050	U	0.41	UJ
Arsenic	µg/L	--	0.045	**3.2**		**7.1**		**2.8**		**7.1**		**3.1**		**7.2**		**5.2**		**7.7**		**5.5**		**8.5**	
Barium	µg/L	--	2,600	68.7		138		63.0		171		68.1		168		81.2		345		68.1		373	
Beryllium	µg/L	--	73	0.66	U	0.22	J	0.66	U	0.41	J	0.070	J	0.37	J	0.66	U	0.82	J	0.66	U	1.1	
Boron	µg/L	--	7,300	139		126		125		128		136		126		188		159		225		172	
Cadmium	µg/L	--	18	0.25	U	0.12	J	0.25	U	0.16	J	0.25	U	0.16	J	0.12	J	0.36	J	0.25	U	0.40	J
Calcium	µg/L	--	--	66,400		65,000		68,500		73,000		68,700		72,500		135,000		159,999		123,000		171,999	
Chromium	µg/L	--	--	0.75	J	2.9		0.68	J	4.2		0.81	J	4.0		0.72	J	6.5		0.24	J	8.1	
Cobalt	µg/L	--	730	0.56	J	2.6		0.49	J	3.9		0.63	J	3.3		0.58	J	5.0		0.20	J	6.1	
Copper	µg/L	--	1,500	6.2		20.6		7.1		27.3		7.6		22.8		70.2		32.0		8.8		34.9	
Cyanide	µg/L	9.7	730	***10***	U	***10.0***	U	***10***	U	***10.0***	U	***10***	U	***10.0***	U	***10***	U	***10.0***	U	***10***	U	***10.0***	U
Iron	µg/L	--	11,000	687		3,010		640		4,690		738		4,420		552		7,180		47.3	U	8,970	
Lead	µg/L	--	--	0.87	J	6.0		0.86	J	10.3		1.0		9.3		4.3		20.7		0.14	J	24.3	
Magnesium	µg/L	--	--	18,900		17,000		19,700		18,400		19,700		18,200		30,200		29,000		27,400		30,000	
Manganese	µg/L	--	880	145		339	J-	134		414	J-	146		403	J-	31.6		471	J-	92.0		538	J-
Mercury	µg/L	--	11	0.20	U	0.20	U	0.20	U	0.20	U	0.20	U	0.20	U	0.20	U	0.033		0.20	U	0.20	U
Molybdenum	µg/L	--	180	5.3	J	4.8		4.9	J	4.0		5.4	J	4.2		17.8	J	11.4		20.1	J	11.9	
Nickel	µg/L	--	730	2.1		6.3		2.0		8.5		2.3		7.5		1.3		8.8		0.55	J	10.6	
Potassium	µg/L	--	--	4,960	J	7,260	J	5,280	J	7,790	J	5,270	J	7,800	J	5,140	J	11,300	J	6,570	J	11,500	J
Selenium	µg/L	2	180	0.97	J	0.88	J	0.49	J	0.83	J	0.44	J	0.67	J	0.37	J	1.2	J	0.29	J	1.2	J
Silver	µg/L	--	180	0.36	U	0.030	UJ	0.36	U	0.050	UJ	0.040	J	0.050	UJ	0.050	J	0.090	UJ	0.36	U	0.12	UJ
Sodium	µg/L	--	--	132,000		107,000		135,000		107,000		134,000		108,000		152,000		126,000		174,999		132,000	
Thallium	µg/L	--	2.4	1.0	U	0.070	J	1.0	U	0.11	J	1.0	U	0.10	J	1.0	U	0.18	J	1.0	U	0.24	UJ
Vanadium	µg/L	--	36	6.4	J	15.0		5.9	J	17.8		6.4	J	16.8		4.9	J	18.9		4.4	J	21.7	
Zinc	µg/L	--	11,000	4.2		15.3		3.3		26.4		3.7		27.0		7.1		42.5		2.4		49.7	
Dissolved Aluminum	µg/L	--	36,000	21	J	108		80.9		634		87	U	7.8	J	87	U	90.5		87	U	9.8	J
Dissolved Antimony	µg/L	30	15	0.43	UJ	0.24	U	0.38	UJ	0.27	U	0.31	UJ	0.25	U	0.29	UJ	0.2	U	0.17	UJ	0.35	U
Dissolved Arsenic	µg/L	190	0.045	**2.5**		**6.2**		**2.4**		**6.9**		**2.5**		**6.6**		**3.7**		**5.6**		**5.2**		**5.6**	
Dissolved Barium	µg/L	--	2,600	56.5		85.2		53.2		93.6		53.2		94.3		65.4		203		66.4		212	
Dissolved Beryllium	µg/L	5.3	73	0.66	U	0.66	U	0.66	U	0.03	J	0.66	U	0.66	U	0.66	U	0.66	U	0.66	U	0.02	J
Dissolved Boron	µg/L	--	7,300	NA		121		NA		128		NA		120		NA		150		NA		175	
Dissolved Cadmium	µg/L	4.1	18	0.25	U	0.25	U	0.25	U	0.02	J	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U	0.25	U
Dissolved Calcium	µg/L	--	--	64,700		52,000		64,100		55,400		64,600		56,400		132,000		128,000		125,000		135,000	
Dissolved Chromium	µg/L	--	--	2	U	0.1	J	2	U	0.43	J	2	U	2	U	0.22	UJ	0.09	J	0.22	UJ	2	U
Dissolved Cobalt	µg/L	--	730	3.3		0.41	J	3.4		0.74	J	1.7		0.42	J	3.3		0.54	J	2.9		0.55	J
Dissolved Copper	µg/L	18	1,500	2.9		3.9		2.7		4.2		2.6		7.9		8		0.59	J	4.5		0.93	J
Dissolved Iron	µg/L	--	11,000	300	U	435	J	300	U	881	J	300	U	378	J	300	U	829	J	300	U	878	J
Dissolved Lead	µg/L	6	--	1	U	0.24	J	0.06	U	1.1		1	U	0.08	J	1	U	0.31	J	1	U	0.09	J

TABLE 4-13
Surface Water Sampling Laboratory Values for Inorganic Parameters
Gila River and San Pedro River
Remedial Investigation Report
ASARCO LLC Hayden, Arizona Plant Site

The data in this table are illustrated on figures 4-24, 4-25, 4-27, 4-28, 4-29, 4-30, 4-31, 4-32, 4-33, and 4-34.

	Location:	Arizona Aquatic & Wildlife Water Quality Criteria[1]	EPA Region IX Preliminary Remediation Goal[2]	GR-SW-09				GR-SW-10				GR-SW-11				SPR-SW-01				SPR-SW-02			
	Event:			Winter		Summer		Winter		Summer		Winter		Summer		Winter		Summer		Winter		Summer	
	Date:			3/8/06		8/23/06		3/8/06		8/23/06		3/8/06		8/22/06		3/8/06		8/22/06		3/8/06		8/22/06	
Parameter	**Units**			**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**
Dissolved Magnesium	µg/L	--	--	18,300		15,200		18,100		15,900		18,300		16,100		28,900		25,200		27,200		26,400	
Dissolved Manganese	µg/L	--	880	56.8		33.6		50.5		73.6		40.5		83.9		7.9		89.5		82.9		110	
Dissolved Mercury	µg/L	0.01	11	***0.037***	UJ	***0.2***	U	***0.043***	UJ	***0.2***	U	***0.039***	UJ	***0.2***	U	***0.053***	UJ	***0.2***	U	***0.048***	UJ	***0.2***	U
Dissolved Molybdenum	µg/L	--	180	5.4		5.9	J	5.1		6.4	J	5.3		6.7	J	16.6		16.7	J	20.3		21.9	J
Dissolved Nickel	µg/L	104	730	1.8		2.7	J	1.6		3.5	J	1.4		2.8	J	0.89	UJ	3	J	0.65	UJ	2.4	J
Dissolved Potassium	µg/L	--	--	5,260	J	5,990	J	5,190	J	6,260	J	5,220	J	6,160	J	5,350	J	8,010	J	7,210	J	8,720	J
Dissolved Selenium	µg/L	--	180	0.31	J	0.8	J	0.2	J	1.3	J	0.26	J	1.2	J	0.65	J	2.8	J	0.43	J	1.3	J
Dissolved Silver	µg/L	14	180	0.36	U	0.36	U	0.36	U	0.36	U	0.36	U	0.36	U	0.36	U	0.36	U	0.36	U	0.36	U
Dissolved Sodium	µg/L	--	--	129,000		99,999		126,000		102,000		128,000		102,999		147,000		119,000		173,000		126,999	
Dissolved Thallium	µg/L	150	2.4	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Dissolved Vanadium	µg/L	--	36	4.8		10.3		4.5		11.4		4.6		10.7		3.6		7.7		4.2		8	
Dissolved Zinc	µg/L	235	11,000	2.5		3.1	J	1.6	UJ	9	J	1.3	UJ	2.6	J	1.3	J	2.8	J	2.5		2.2	J

Table Notes:

[1] Arizona Department of Environmental Quality Aquatic & Wildlife Water Quality Critereia, Title 18 Chapter 11, March 2003
[2] EPA Region IX Preliminary Remediation Goals, Tap Water, October 2004
[3] Bold values with bold outline exceed one or more of the comparison criteria.
[4] Bold italicized values have detection limits above one or more of the comparison criteria.
[5] -- = Not established
[6] °C = Degrees Celsius
[7] J = Estimated value
[8] J+ = Estimated value, may be biased high
[9] J- = Estimated value, may be biased low
[10] U = Not detected; reporting limit is shown in place of a result.
[11] µg/L = micrograms per Liter
[12] UJ = Not detected; reporting limit is approximate and is shown in place of a result.

TABLE 4-14
In-Stream Sediment Sampling Laboratory Values for Inorganic Parameters
Gila River and San Pedro River
Remedial Investigation Report
ASARCO LLC Hayden, Arizona Plant Site

The data in this table are illustrated on figures 4-38, 4-40, 4-41, 4-42, and 4-43.

	Location:	Arizona Residential Soil Remediation Level[1]	EPA Region IX Preliminary Remediation Goal[2]	GR-SED-01						GR-SED-02						GR-SED-03				GR-SED-04			
	Event:			Winter		Winter (Duplicate)		Summer		Winter		Summer		Summer (Duplicate)		Winter		Summer		Winter		Summer	
	Date:			3/7/06		3/7/06		8/22/06		3/7/06		8/22/06		8/22/06		3/7/06		8/22/06		3/8/06		8/22/06	
Parameter	**Units**			**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**
Aluminum	mg/kg	76,000	76,000	17,500		18,500		16,200		17,800		18,400		19,600		19,400		20,400		6,750		8,850	
Antimony	mg/kg	31	31	1.1	J	1.1	J	0.57	J	1.2	J	0.71	J	0.64	J	1.1	J	0.52	J	0.48	J	0.47	J
Arsenic	mg/kg	10	0.39	**2.1**		**1.4**		**2**		**4.4**		**2.4**		**2.4**		**5**		**2.7**		**1.1**		**2.5**	
Barium	mg/kg	15,000	5,400	59.6	J	59.4	J	82.8	J	151	J	126	J	133	J	177	J	158	J	51.8	J	67.1	J
Beryllium	mg/kg	150	150	0.54	U	0.55	U	0.52	J	0.29	J	0.6		0.63	J	0.46	J	0.67		0.09	J	0.35	J
Boron	mg/kg	16,000	16,000	2.4	J	2.5	J	1.6	J	10.2	J	2.2	J	2.6	J	10.9	J	3	J	1.7	J	1.8	J
Cadmium	mg/kg	39	37	0.42	U	0.42	U	0.47	U	0.82	U	0.46	U	0.49	U	0.06	J	0.5	U	0.52	U	0.46	U
Calcium	mg/kg	--	--	32,100		30,300		22,200		39,600		22,000		23,700		41,900		31,800		8,940		13,300	
Chromium	mg/kg	--	210	14.4	J	14	J	11.8		14	J	8.8		10.1		15.5	J	10.2		6	J	6.4	
Cobalt	mg/kg	900	900	16.2	J	16.6	J	11.9		14.5	J	10.5	J	11	J	14.8	J	10.5	J	5.8	J	6.4	J
Copper	mg/kg	3,100	3,100	45	J	62.2	J	57.5		191	J	74.8		80.4		392	J	71.9		29.3	J	49.9	
Cyanide	mg/kg	1,200	1,200	2.6	U	2.7	U	3.1	U	5.1	U	2.9	U	3.1	U	6.1	U	3.3	U	3.2	U	3.1	U
Iron	mg/kg	--	23,000	**28,500**	J	**28,800**	J	**24,200**		22,500	J	19,200		21,000		22,500	J	20,600		10,700	J	11,600	
Lead	mg/kg	400	400	9.8	J	9.5	J	8.3	J	11.7	J	8.4	J	9.3	J	15.5	J	9.5	J	3.4	J	5.9	J
Magnesium	mg/kg	--	--	9,960		10,900		9,200		9,260		7,910		8,270		9,910		8,400		3,120		4,260	
Manganese	mg/kg	3,300	1,800	515	J	585	J	508		**2,270**	J	440		497		**2,410**	J	461		201	J	286	
Mercury	mg/kg	23	23	0.021	U	0.021	U	0.059	U	0.041	U	0.058	U	0.052	J	0.049	U	0.099		0.026	U	0.059	U
Molybdenum	mg/kg	390	390	2.1	U	2.1	U	2.4	U	1.4	J	2.3	U	2.4	U	2.2	J	2.5	U	0.2	J	0.09	U
Nickel	mg/kg	1,600	1,600	14	J	13.1	J	15.1	J	18.3	J	13.7	J	14.8	J	21.8	J	14	J	7.8	J	10	J
Potassium	mg/kg	--	--	781		747		1,210		2,520		1,730		1,860		2,570		1,950		585	J	889	
Selenium	mg/kg	390	390	0.52	U	0.53	U	1		1.3		0.78		0.8		1.3		0.86		0.65	U	0.59	
Silver	mg/kg	390	390	0.15	J	0.53	U	0.59	U	1	U	0.58	U	0.61	U	1.2	U	0.63	U	0.65	U	0.57	U
Sodium	mg/kg	--	--	966	J	1,100	J	748		2,030	J	831		892		1,230	J	826		1,050	J	494	U
Thallium	mg/kg	5.2	5.2	0.73	U	0.54	J	1.2	J	1.4	U	1.2	J	1	J	1.7	U	1.1	J	0.91	U	0.8	U
Vanadium	mg/kg	78	78	**91.2**		**91.2**		75.8		54.6		53		57.6		49.8		52.9		29.2		28.8	
Zinc	mg/kg	23,000	23,000	48.9		53		46.6		55.5	J	42.6	J	46.9	J	63.9	J	45.9	J	22	J	24.2	J

TABLE 4-14
In-Stream Sediment Sampling Laboratory Values for Inorganic Parameters
Gila River and San Pedro River
Remedial Investigation Report
ASARCO LLC Hayden, Arizona Plant Site

The data in this table are illustrated on figures 4-38, 4-40, 4-41, 4-42, and 4-43.

	Location:	Arizona Residential Soil Remediation Level[1]	EPA Region IX Preliminary Remediation Goal[2]	GR-SED-05						GR-SED-06				GR-SED-07						GR-SED-08				GR-SED-09			
	Event:			Winter		Winter (Duplicate)		Summer		Winter		Summer		Winter		Summer		Summer (Duplicate)		Winter		Summer		Winter		Summer	
	Date:			3/8/06		3/8/06		8/22/06		3/8/06		8/23/06		3/8/06		8/23/06		8/23/06		3/8/06		8/23/06		3/8/06		8/23/06	
Parameter	Units			Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual
Aluminum	mg/kg	76,000	76,000	12,800		14,500		4,240		13,200		11,400		20,300		17,200		14,800		18,900		18,400		13,000		14,900	
Antimony	mg/kg	31	31	0.77	J	0.98	J	1.2	UJ	0.93	J	0.68	J	0.97	J	0.58	J	0.6	J	1.2	J	0.7	J	0.64	J	0.43	J
Arsenic	mg/kg	10	0.39	**2.7**		**2.9**		**1.1**		**2.7**		**4.3**		**4.6**		**5.1**		**4.2**		**4.2**		**5.3**		**2.8**		**4.9**	
Barium	mg/kg	15,000	5,400	99.1	J	107	J	76.4	J	97.9	J	141	J	154	J	164	J	152	J	145	J	170	J	113	J	180	J
Beryllium	mg/kg	150	150	0.34	J	0.35	J	0.25	J	0.39	J	0.75		0.54	J	1		0.85		0.61	J	0.92		0.4	J	1	
Boron	mg/kg	16,000	16,000	4.6	J	4.9	J	0.81	J	5.6	J	5.4	J	9.9	J	8.3	J	6	J	8.8	J	6.9	J	7.1	J	6.2	J
Cadmium	mg/kg	39	37	0.52	U	0.04	J	0.5	U	0.69	U	0.48	U	0.04	J	0.59	U	0.56	U	0.66	U	0.68	U	1.1	U	0.59	U
Calcium	mg/kg	--	--	19,900		21,700		8,140		21,800		31,500		36,500		31,600		28,100		33,900		34,800		27,000		32,700	
Chromium	mg/kg	--	210	11.2	J	12.1	J	4.3		12.2	J	18.4		17.2	J	14.7		13.6		21	J	14.7		11.1	J	12.7	
Cobalt	mg/kg	900	900	8.8	J	10	J	3.2	J	9.3	J	7.9	J	14.6	J	10.1	J	9.6	J	13.6	J	11.5	J	9.2	J	8.8	J
Copper	mg/kg	3,100	3,100	96	J	129	J	11.6	J	88.2	J	68.1		158	J	134		117		177	J	142		109	J	93	
Cyanide	mg/kg	1,200	1,200	3.3	U	3.4	U	3.1	U	4.3	U	3.3	U	5.1	U	3.8	U	3.6	U	4.1	U	4.2	U	6.9	U	3.9	U
Iron	mg/kg	--	23,000	16,000	J	18,200	J	6,890		17,300	J	18,700		**24,700**	J	19,400		18,400		**26,300**	J	20,400		15,100	J	16,900	
Lead	mg/kg	400	400	17.6	J	12.5	J	4.9	J	11.7	J	18.1	J	16.4	J	17.8	J	15.2	J	18.5	J	19.8	J	11.6	J	21.2	J
Magnesium	mg/kg	--	--	5,720		6,520		2,260		5,960		5,930		9,850		8,550		7,430		9,070		8,670		6,190		7,520	
Manganese	mg/kg	3,300	1,800	458	J	473	J	113	J	437	J	467		1,080	J	574		567		1,010	J	665		1,410	J	573	
Mercury	mg/kg	23	23	0.026	U	0.027	U	0.063	U	0.034	U	0.077		0.039	J	0.088		0.091		0.033	U	0.1		0.056	U	0.087	
Molybdenum	mg/kg	390	390	0.46	J	0.6	J	2.5	U	1.8	J	0.24	U	2.2	J	1.4	U	1.4	U	2.4	J	0.88	U	1.5	J	0.38	U
Nickel	mg/kg	1,600	1,600	12.5	J	13.7	J	6.1	J	12.6	J	14	J	20.6	J	18	J	16.1	J	19.3	J	19	J	14.3	J	15.6	J
Potassium	mg/kg	--	--	1,740		1,850		969		2,230		2,580		3,220		3,730		3,140		3,320		3,490		2,210		3,590	
Selenium	mg/kg	390	390	0.66	U	0.68	U	0.63	U	0.86	U	0.74		1	U	0.7	J	0.7	U	0.82	U	0.82	J	1.4	U	0.6	J
Silver	mg/kg	390	390	0.66	U	0.68	U	0.63	U	0.86	U	0.61	U	1	U	0.74	U	0.7	U	0.82	U	0.84	U	1.4	U	0.73	U
Sodium	mg/kg	--	--	681	J	729	J	536	U	664	J	471	U	2,790	J	500	U	524	U	1,550	J	633	U	867	J	406	U
Thallium	mg/kg	5.2	5.2	0.57	J	0.95	U	0.88	U	1.2	U	0.85	UJ	1.4	U	1	UJ	0.81	J	1.1	U	1.2	UJ	1.9	U	1	UJ
Vanadium	mg/kg	78	78	38.3		43.4		14.6		39.1		47.5		53.4		40		39.8		60.7		42.1		30.9		30.9	
Zinc	mg/kg	23,000	23,000	41	J	46.7	J	14.5	J	47.8	J	51.6		70.7	J	63.1		55.9		74.9		66.9		44.6	J	66	

TABLE 4-14
In-Stream Sediment Sampling Laboratory Values for Inorganic Parameters
Gila River and San Pedro River
Remedial Investigation Report
ASARCO LLC Hayden, Arizona Plant Site

The data in this table are illustrated on figures 4-38, 4-40, 4-41, 4-42, and 4-43.

	Location:	Arizona Residential Soil Remediation Level[1]	EPA Region IX Preliminary Remediation Goal[2]	GR-SED-10				GR-SED-11				SPR-SED-01				SPR-SED-02			
	Event:			Winter		Summer		Winter		Summer		Winter		Summer		Winter		Summer	
	Date:			3/8/06		8/23/06		3/8/06		8/23/06		3/8/06		8/22/06		3/8/06		8/22/06	
Parameter	**Units**			**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**
Aluminum	mg/kg	76,000	76,000	16,300		13,100		20,000		13,700		4,250		4,430		4,540		11,000	
Antimony	mg/kg	31	31	1	J	0.44	J	0.99	J	0.4	J	0.56	J	0.21	J	0.45	J	0.49	J
Arsenic	mg/kg	10	0.39	**4.5**		**4.6**		**5.5**		**3.6**		**2.6**		**1.4**		**2**		**4.2**	
Barium	mg/kg	15,000	5,400	140	J	168	J	176	J	140	J	69.6	J	101	J	61.4	J	177	J
Beryllium	mg/kg	150	150	0.49	J	0.83		0.75	J	0.68	J	0.22	J	0.33	J	0.15	J	0.76	
Boron	mg/kg	16,000	16,000	8.6	J	5.5	J	10.8	J	5.2	J	1.4	J	0.9	J	1.9	J	4.1	J
Cadmium	mg/kg	39	37	0.03	J	0.56	U	0.11	J	0.58	U	0.12	J	0.43	U	0.47	U	0.52	U
Calcium	mg/kg	--	--	32,300		28,600		36,900		28,100		8,080		8,020		7,800		40,600	
Chromium	mg/kg	--	210	14.2	J	12.4		17.9	J	13.3		2.9	J	4.1		4.3	J	11.8	
Cobalt	mg/kg	900	900	12.1	J	8.5	J	13.6	J	9.8	J	3.2	J	3.4	J	4.9	J	6.6	J
Copper	mg/kg	3,100	3,100	147	J	91.7		144	J	107		143	J	9.1	J	16.8	J	35.4	
Cyanide	mg/kg	1,200	1,200	4.8	U	3.8	U	4.1	U	3.7	U	2.9	U	2.7	U	3	U	3.3	U
Iron	mg/kg	--	23,000	19,600	J	15,700		**23,800**	J	17,500		5,480	J	6,620		8,710	J	13,700	
Lead	mg/kg	400	400	15	J	18.5	J	21.1	J	13.9	J	10.5	J	7.1	J	6.7	J	15.9	J
Magnesium	mg/kg	--	--	8,050		7,050		9,300		7,440		2,110		2,420		2,890		6,060	
Manganese	mg/kg	3,300	1,800	1,470	J	473		1,170	J	576		183	J	155		173	J	399	
Mercury	mg/kg	23	23	0.034	J	0.087		0.03	J	0.076		0.023	U	0.058	U	0.024	U	0.066	U
Molybdenum	mg/kg	390	390	1.5	J	0.39	U	1.4	J	0.35	U	1.6	J	2.1	U	1.9	J	0.34	U
Nickel	mg/kg	1,600	1,600	17.8	J	16.5	J	20.1	J	16.7	J	5.2	J	7	J	7.3	J	12.5	J
Potassium	mg/kg	--	--	2,800		3,080		3,760		2,630		876		1,020		715		2,840	
Selenium	mg/kg	390	390	0.93	J	0.51	J	0.82	U	0.9		0.58	U	0.53	U	0.59	U	0.66	U
Silver	mg/kg	390	390	0.97	U	0.7	U	0.82	U	0.73	U	0.58	U	0.53	U	0.59	U	0.66	U
Sodium	mg/kg	--	--	1,160	J	437	U	1,390	J	936		364	J	429	U	387	J	265	U
Thallium	mg/kg	5.2	5.2	1.4	U	0.97	U	1.2		0.76	J	0.81	U	0.75	U	0.83	U	0.6	J
Vanadium	mg/kg	78	78	41.2		30.3		50		38.4		8.7		11.1		14.2		26.5	
Zinc	mg/kg	23,000	23,000	63.5	J	58.2		74.1		50.2	J	20	J	17	J	18.1	J	48	J

Table Notes:

[1] Arizona Department of Environmental Quality Residential Soil Remediation Levels, Title 18 Chapter 7, January 2008

[2] EPA Region IX Preliminary Remediation Goals, Residential Soil, October 2004

[3] Bold values with bold outline exceed one or more of the comparison criteria.

[4] -- = Not established

[5] J = Estimated value

[6] mg/kg = milligrams per kilogram

[7] U = Not detected; reporting limit is shown in place of a result.

[8] UJ = Not detected; reporting limit is approximate and is shown in place of a result.

TABLE 4-15
Stable and Unstable Riparian Sediment Sampling Laboratory Values for Inorganic Parameters
Gila River and San Pedro River
Remedial Investigation Report
ASARCO LLC Hayden, Arizona Plant Site

The data in this table are illustrated on figures 4-39, 4-44, 4-45, 4-46, and 4-47.

	Location:	Arizona	EPA Region IX	GR-REF-01S		GR-REF-01U		GR1-01S		GR1-01U		GR2-01S		GR2-01S (Duplicate)		GR2-01U		GR3-01S		GR3-01U		GR4-01S		GR4-01U		GR5-01S	
	Date:	Residential Soil	Preliminary	4/28/06		4/28/06		4/27/06		4/27/06		4/27/06		4/27/06		4/27/06		4/27/06		4/27/06		4/27/06		4/27/06		4/27/06	
Parameter	Units	Remediation Level[1]	Remediation Goal[2]	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual
Aluminum	mg/kg	76,000	76,000	15,300		17,800		16,500		23,400		13,100		13,100		20,000		15,700		20,000		12,700		16,500		8,210	
Antimony	mg/kg	31	31	0.59	J	0.62	J	0.87	J	0.89	J	0.77	J	0.64	J	0.92	J	0.84	J	0.61	J	0.53	J	0.55	J	0.39	J
Arsenic	mg/kg	10	0.39	**2.7**		**4**		**2.2**		**1.2**		**4**		**4**		**6.7**		**7.5**		**3.8**		**2.7**		**3.6**		**2.7**	
Barium	mg/kg	15,000	5,400	92.7		136		71.3		44.6		84.2		85.2		132		108		114		99.4		130		89.9	
Beryllium	mg/kg	150	150	0.48	UJ	0.71		0.49	UJ	0.46	UJ	0.49	UJ	0.49	UJ	0.8		0.54		0.71	UJ	0.52		0.79	UJ	0.52	
Boron	mg/kg	16,000	16,000	1.1		7.5		0.68		0.62		1.5		1.5		4.8		2.9		3.6		4.9		6.2		4.4	
Cadmium	mg/kg	39	37	0.1	UJ	0.14	UJ	0.13	UJ	0.21	UJ	0.3	UJ	0.29	UJ	0.95	J	0.7	J	0.48	UJ	0.04	UJ	0.17	J	0.1	UJ
Calcium	mg/kg	--	--	27,700		42,200		26,800		37,000		21,000		19,700		44,200		22,800		41,800		22,600		35,500		19,300	
Chromium	mg/kg	--	210	11.2		11.7		10.5		8.4		9.2		10.5		16.8		10		12.4		10.6		11.2		9.8	
Cobalt	mg/kg	900	900	11.2		11.7		11.5		17		9.1		9		12.2		9.4		12.8		8.8		11.8		6.1	
Copper	mg/kg	3,100	3,100	85.8		83.3		87.6		95.4		437		443		696		1,150		572		57.3		164		106	
Cyanide	mg/kg	1,200	1,200	2.5	U	3.5	U	2.5	U	3.1	U	2.5	U	2.5	U	3.8	U	2.5	U	3.7	U	2.5	U	4.1	U	2.5	U
Iron	mg/kg	--	23,000	20,000		19,800		20,300		**27,200**		17,700		18,000		22,800		18,100		21,500		16,600		18,700		12,400	
Lead	mg/kg	400	400	9.7		11.8		9		10.7		15.2		14		32.8		25.2		21.4		8.4		15.1		14.6	
Magnesium	mg/kg	--	--	8,490		10,000		9,410		15,600		6,940		7,050		10,000		6,900		10,800		6,990		9,230		4,850	
Manganese	mg/kg	3,300	1,800	381		879		427		695		364		372		584		407		611		437		538		265	
Mercury	mg/kg	23	23	0.051	U	0.061	J	0.02	U	0.025	U	0.02	U	0.018	J	0.035	J	0.05		0.03	U	0.02	U	0.032	U	0.02	U
Molybdenum	mg/kg	390	390	2	U	2.8	U	2	U	2.5	U	1.4		2		2.1		7.1		2		2	U	0.43		0.83	
Nickel	mg/kg	1,600	1,600	16.9		19.1		15		15.8		14.2		14.1		22.1		14.3		18.3		15.3		19.3		11.2	
Potassium	mg/kg	--	--	2,260		2,980		1,740		580	J	1,890		1,880		2,540		2,370		2,480		2,150		2,640		2,400	
Selenium	mg/kg	390	390	0.51	U	0.7	U	0.5	U	0.62	U	0.5	U	0.5	U	0.77	U	0.67	J	0.74	U	0.51	U	0.81	U	0.5	U
Silver	mg/kg	390	390	0.51	U	0.7	U	0.5	U	0.62	U	0.36	J	0.34	J	0.34	J	1.3		0.38	J	0.51	U	0.81	U	0.5	U
Sodium	mg/kg	--	--	606		3,900		647		842		670		620		1,170		943		861		2,690		1,610		525	
Thallium	mg/kg	5.2	5.2	0.71	U	0.98	U	0.71	U	0.87	U	0.71	U	0.71	U	1.1	U	0.71	U	1	U	0.71	U	1.1	U	0.7	U
Vanadium	mg/kg	78	78	51		41.8		57.6		**83.1**		45.9		49.5		51.1		44.1		49.3		40.6		38.9		26.6	
Zinc	mg/kg	23,000	23,000	51.7		56.9		53.4		70.6		53.9		54.1		93.3		83.6		78.2		42.8		62.3		45.7	

TABLE 4-15
Stable and Unstable Riparian Sediment Sampling Laboratory Values for Inorganic Parameters
Gila River and San Pedro River
Remedial Investigation Report
ASARCO LLC Hayden, Arizona Plant Site

The data in this table are illustrated on figures 4-39, 4-44, 4-45, 4-46, and 4-47.

	Location:	Arizona	EPA Region IX	GR5-01U		GR6-01S		GR6-01U		GR7-01S		GR7-01S (Duplicate)		GR7-01U		GR8-01S		GR8-01U		GR9-01S		GR9-01U		GR10-01S	
	Date:	Residential Soil	Preliminary	4/27/06		4/27/06		4/27/06		4/28/06		4/28/06		4/28/06		4/28/06		4/28/06		4/28/06		4/28/06		4/28/06	
Parameter	**Units**	**Remediation Level[1]**	**Remediation Goal[2]**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**
Aluminum	mg/kg	76,000	76,000	22,200		13,600		15,700		17,300		19,200		19,700		11,600		15,500		5,820		10,500		15,400	
Antimony	mg/kg	31	31	0.73	J	0.47	J	0.52	J	0.84	J	0.65	J	0.65	J	0.54	J	0.65	J	0.32	J	0.39	J	0.53	J
Arsenic	mg/kg	10	0.39	**4.4**		**5.2**		**4.4**		**6.9**		**6.4**		**6.6**		**2.8**		**4.6**		**1.2**		**2.8**		**1.5**	
Barium	mg/kg	15,000	5,400	171		140		151		195		205		203		118		159		38.4		109		83.9	
Beryllium	mg/kg	150	150	1		0.84		0.91		1.1		1.2		1.3		0.67		0.94		0.51		0.53		0.5	UJ
Boron	mg/kg	16,000	16,000	5.3		16		7.3		32.5		25.3		8.8		5.4		5.8		2.6		1.5		2.7	
Cadmium	mg/kg	39	37	0.25	UJ	0.27	J	0.21	J	0.21	UJ	0.2	UJ	0.28	UJ	0.2	UJ	0.18	UJ	0.12	UJ	0.05	UJ	0.17	UJ
Calcium	mg/kg	--	--	34,400		33,700		35,700		48,600		52,500		50,400		18,700		39,000		5,390		22,700		20,500	
Chromium	mg/kg	--	210	13.2		12.2		11.8		14.7		14.4		14.6		13.3		12.8		4.1		8.5		12.2	
Cobalt	mg/kg	900	900	10.7		7.9		8.9		10		8.4		9.1		9.9		9.8		4.1	UJ	7.4		10.7	
Copper	mg/kg	3,100	3,100	145		198		93.8		239		139		74		117		87.8		51.8		40.2		90.2	
Cyanide	mg/kg	1,200	1,200	3.3	U	2.9	U	0.26	J	0.26	J-	3.4	U	3.4	U	2.6	U	3.6	U	2.5	U	2.6	U	2.6	U
Iron	mg/kg	--	23,000	20,000		15,800		16,800		19,600		18,400		18,400		17,600		17,600		8,480		13,200		17,100	
Lead	mg/kg	400	400	20.4		21.2		16.9		28.2		22.2		25.7		20.4		18.6		15.5		10.3		11.9	
Magnesium	mg/kg	--	--	8,790		7,290		8,330		12,100		11,300		9,230		8,160		8,250		3,160		5,500		10,600	
Manganese	mg/kg	3,300	1,800	614		443		498		596		526		638		536		545		364		339		532	
Mercury	mg/kg	23	23	0.045	J	0.057		0.032	J	0.11	J	0.13	J	0.12	J	0.044	U	0.12	J	0.05	U	0.051	U	0.051	U
Molybdenum	mg/kg	390	390	0.18		4		0.38		4.4		1.4		0.49		0.62		0.34		0.31		2	U	2.1	U
Nickel	mg/kg	1,600	1,600	16.4		14		15.5		17.8		15.7		16.7		17.5		17.3		5.2		11.6		19.9	
Potassium	mg/kg	--	--	3,620		4,740		3,660		5,570		5,620		4,690		3,810		3,590		1,670		1,860		2,610	
Selenium	mg/kg	390	390	0.66	U	0.58	U	0.55	U	0.74	U	0.68	U	0.67	U	0.52	U	0.71	U	0.5	U	0.51	U	0.51	U
Silver	mg/kg	390	390	0.66	U	0.58	U	0.55	U	0.74	U	0.68	U	0.67	U	0.52	U	0.71	U	0.5	U	0.51	U	0.51	U
Sodium	mg/kg	--	--	1,020		3,760		2,070		10,700		10,100		1,110		2,470		706	J	326	J	600		539	
Thallium	mg/kg	5.2	5.2	0.92	U	0.81	U	0.77	U	1	U	0.96	U	0.94	U	0.72	U	0.99	U	0.7	U	0.72	U	0.72	U
Vanadium	mg/kg	78	78	40.4		30.4		32.3		35.9		30.3		29.9		30		33.7		11.1		29.6		40.8	
Zinc	mg/kg	23,000	23,000	70.5		78.6		61.2		100		81.2		78		79.2		65.5		45.8		40.1		60.4	

TABLE 4-15
Stable and Unstable Riparian Sediment Sampling Laboratory Values for Inorganic Parameters
Gila River and San Pedro River
Remedial Investigation Report
ASARCO LLC Hayden, Arizona Plant Site

The data in this table are illustrated on figures 4-39, 4-44, 4-45, 4-46, and 4-47.

	Location:	Arizona	EPA Region IX	GR10-01U		GR10-01U (Duplicate)		GR11-01S		GR11-01U		GR12-01S		GR13-01S		GR14-01S		GR15-01S		GR16-01S		SPR1-01S		SPR1-01S (Duplicate)	
	Date:	Residential Soil	Preliminary	4/28/06		4/28/06		4/28/06		4/28/06		4/28/06		4/28/06		4/27/06		4/28/06		4/28/06		4/27/06		4/27/06	
Parameter	Units	Remediation Level[1]	Remediation Goal[2]	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual
Aluminum	mg/kg	76,000	76,000	13,500		13,300		8,770		15,600		6,550		8,670		9,380		7,980		23,400		6,590		6,980	
Antimony	mg/kg	31	31	0.51	J	0.52	J	0.4	J	0.6	J	0.48	J	0.39	J	0.48	J	0.38	J	0.45	J	0.34	J	0.37	J
Arsenic	mg/kg	10	0.39	**3.1**		**2.8**		**3.4**		**4.6**		**2.7**		**3.5**		**3**		**3.1**		**8.1**		**2.3**		**2.1**	
Barium	mg/kg	15,000	5,400	109		105		103		145		50.5		132		105		110		202		86.8		92.5	
Beryllium	mg/kg	150	150	0.64		0.63		0.59		0.87		0.44	UJ	0.53		0.59		0.48	UJ	1.6		0.51		0.52	
Boron	mg/kg	16,000	16,000	2.4		2.2		3.1		5.6		0.48		4.6		3.5		2.9		10		1.4		1.6	
Cadmium	mg/kg	39	37	0.14	UJ	0.15	UJ	0.07	UJ	0.25	UJ	0.04	J	0.17	J	0.06	J	0.05	UJ	0.42	UJ	0.4	UJ	0.02	UJ
Calcium	mg/kg	--	--	24,200		23,300		24,100		36,700		17,200		22,600		21,900		21,300		45,700		15,800		15,800	
Chromium	mg/kg	--	210	12.4		11.7		13		12.9		11.7		9.2		10.6		8.3		16.6		8.2		8.2	
Cobalt	mg/kg	900	900	9.2		9.4		7		10.3		7.4		7.4		6.4		5.9		10.3		4.5	UJ	4.7	UJ
Copper	mg/kg	3,100	3,100	91.6		87.8		69.9		103		245		226		55.1		73.4		102		36.6		35	
Cyanide	mg/kg	1,200	1,200	2.9	U	2.8	U	2.6	U	3.2	U	2.5	U	2.5	U	2.6	U	2.5	U	3.6	U	2.5	U	2.5	U
Iron	mg/kg	--	23,000	16,300		16,300		14,100		18,000		14,900		12,300		13,200		11,100		20,700		9,870		10,100	
Lead	mg/kg	400	400	16		14.4		17.1		20.8		10		13.8		13.6		13.6		60.8		10.2		10.3	
Magnesium	mg/kg	--	--	7,730		7,810		5,380		8,390		4,310		5,670		5,520		5,050		10,200		3,690		3,890	
Manganese	mg/kg	3,300	1,800	417		417		361		619		210		310		287		259		794		194		210	
Mercury	mg/kg	23	23	0.058	U	0.056	U	0.051	U	0.078	J	0.02	U	0.05	U	0.033	J	0.073	J	0.15		0.023	J	0.02	U
Molybdenum	mg/kg	390	390	0.1		0.38		0.16		0.51		3.1		2.8		0.84		0.53		1.1		2	U	0.07	
Nickel	mg/kg	1,600	1,600	16.5		16.4		13		17.7		11.9		13.5		12.8		11.9		18.1		9.5		9.9	
Potassium	mg/kg	--	--	2,420		2,340		2,030		3,310		1,470		3,130		2,720		3,080		5,500		1,720		1,850	
Selenium	mg/kg	390	390	0.58	U	0.56	U	0.51	U	0.63	U	0.5	U	0.5	U	0.51	U	0.51	U	0.73	U	0.5	U	0.51	U
Silver	mg/kg	390	390	0.58	U	0.56	U	0.51	U	0.63	U	0.5	U	0.5	U	0.51	U	0.51	U	0.73	U	0.5	U	0.51	U
Sodium	mg/kg	--	--	808		893		843		1,700		237	J	856		1,550		381	J	2,720		230	J	230	J
Thallium	mg/kg	5.2	5.2	0.81	U	0.78	U	0.72	U	0.88	U	0.7	U	0.7	U	0.72	U	0.71	U	1	U	0.7	U	0.71	U
Vanadium	mg/kg	78	78	35.8		35.6		33.5		34.8		35.6		23.3		26.9		21.4		32.6		20.6		19.9	
Zinc	mg/kg	23,000	23,000	59.4		58.9		55.1		76		43.6		55.8		48.8		46.3		112		35.3		37.9	

TABLE 4-15
Stable and Unstable Riparian Sediment Sampling Laboratory Values for Inorganic Parameters
Gila River and San Pedro River
Remedial Investigation Report
ASARCO LLC Hayden, Arizona Plant Site

The data in this table are illustrated on figures 4-39, 4-44, 4-45, 4-46, and 4-47.

	Location:	Arizona	EPA Region IX	SPR1-01U		SPR2-01S		SPR2-01U	
	Date:	Residential Soil	Preliminary	4/27/06		4/27/06		4/27/06	
Parameter	**Units**	**Remediation Level[1]**	**Remediation Goal[2]**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**
Aluminum	mg/kg	76,000	76,000	4,640		7,180		15,100	
Antimony	mg/kg	31	31	0.38	J	0.3	J	0.58	J
Arsenic	mg/kg	10	0.39	**2.4**		**1.9**		**4.8**	
Barium	mg/kg	15,000	5,400	51.2		114		146	
Beryllium	mg/kg	150	150	0.35	UJ	0.53		0.96	
Boron	mg/kg	16,000	16,000	0.88		1.4		5.7	
Cadmium	mg/kg	39	37	0.09	UJ	0.4	UJ	0.27	UJ
Calcium	mg/kg	--	--	7,250		12,500		28,400	
Chromium	mg/kg	--	210	4.1		6.7		13.8	
Cobalt	mg/kg	900	900	3.7	UJ	4.5	UJ	8.9	
Copper	mg/kg	3,100	3,100	322		21.6		91.5	
Cyanide	mg/kg	1,200	1,200	2.6	U	2.5	U	0.34	J
Iron	mg/kg	--	23,000	6,570		9,490		18,000	
Lead	mg/kg	400	400	11.4		9		22.3	
Magnesium	mg/kg	--	--	2,540		3,530		6,920	
Manganese	mg/kg	3,300	1,800	158		186		591	
Mercury	mg/kg	23	23	0.021	U	0.051		0.043	
Molybdenum	mg/kg	390	390	1.7		2	U	0.46	
Nickel	mg/kg	1,600	1,600	6.8		8.8		16	
Potassium	mg/kg	--	--	864		1,750		4,070	
Selenium	mg/kg	390	390	0.52	U	0.5	U	0.52	U
Silver	mg/kg	390	390	0.24	J	0.5	U	0.52	U
Sodium	mg/kg	--	--	419	J	436	J	929	
Thallium	mg/kg	5.2	5.2	0.72	U	0.7	U	0.73	U
Vanadium	mg/kg	78	78	10.9		17.9		32.2	
Zinc	mg/kg	23,000	23,000	29		28.7		69.3	

Table Notes:

[1] Arizona Department of Environmental Quality Residential Soil Remediation Levels, Title 18 Chapter 7, January 2008

[2] EPA Region IX Preliminary Remediation Goals, Residential Soil, October 2004

[3] Bold values with bold outline exceed one or more of the comparison criteria.

[4] -- = Not established

[5] J = Estimated value

[7] J- = Estimated value, may be biased low

[7] mg/kg = milligrams per kilogram

[8] U = Not detected; reporting limit is shown in place of a result.

[9] UJ = Not detected; reporting limit is approximate and is shown in place of a result.

TABLE 4-16
Groundwater Sampling Laboratory Values for Inorganic and Field Parameters
Monitoring Wells
Remedial Investigation Report
ASARCO LLC Hayden, Arizona Plant Site

The data in this table are illustrated on figures 4-48, 4-49, 4-50, and 4-51.

	Location:	EPA Maximum Contaminant Level[1]	EPA Region IX Preliminary Remediation Goal[2]	GW-01(R)				GW-02				GW-03								GW-06			
	Event:			Winter		Summer		Winter		Summer		Winter		Winter (Duplicate)		Summer		Summer (Duplicate)		Winter		Summer	
	Date:			3/24/06		8/31/06-9/13/06		3/3/06		8/31/06		3/3/06		3/3/06		8/31/06-9/1/06		9/1/06		3/3/06		9/1/06	
Parameter	Units			Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual
Aluminum	µg/L	50 [5]	36,000	NA		**29,900**		NA		39.9	UJ	20		**52**		***200***	UJ	***200***	UJ	**1,800**		***75.7***	UJ
Antimony	µg/L	6.0	15	NA		4	U	NA		**9.2**		1	U	1	U	0.18	UJ	0.19	UJ	1	U	0.27	UJ
Arsenic	µg/L	10	0.045	NA		**5.9**		NA		**34.4**		**5.7**		**5.8**		**3.6**		**3.8**		**4**		**3**	
Barium	µg/L	2,000	2,600	NA		95.8		NA		26.9		27		28		42.3	J	44.7	J	13		4.5	J
Beryllium	µg/L	4.0	73	NA		0.2	UJ	NA		1	U	0.5	U	0.5	U	0.03	UJ	0.03	UJ	0.5	U	0.08	UJ
Boron	µg/L	--	7,300	NA		117		NA		181		180		180		155		154		58	J	66.5	
Cadmium	µg/L	5.0	18	NA		0.21	J	NA		**9.2**		1	U	1	U	1	U	1	U	1	U	1	U
Calcium	µg/L	--	--	NA		231,000		NA		134,000		71,000		67,000		97,600		102,999		140,000		132,000	
Chromium	µg/L	100	--	NA		26		NA		8.4		1	U	0.95	J	0.37	J	0.4	J	10		8.5	
Cobalt	µg/L	--	730	NA		22		NA		0.27	UJ	0.5	U	0.5	U	0.19	UJ	0.19	UJ	4.7		3.9	
Copper	µg/L	1,000 [5]	1,500	NA		149	J	NA		2	UJ	1.7	J	1.8	J	2.4		2.1		120		2.8	J
Cyanide	µg/L	200	730	NA		12.4		NA		10	U	10	U	10	U	10	U	10	U	8.6	J	7.8	J
Iron	µg/L	300 [5]	11,000	NA		**22,400**		NA		100	U	100	U	51	J	100	UJ	100	UJ	**1,600**		100	U
Lead	µg/L	15	--	NA		4.9		NA		0.04	UJ	2	U	2	U	0.06	UJ	0.06	UJ	6.9		0.15	UJ
Magnesium	µg/L	--	--	NA		173,000		NA		52,600		15,000		14,000		20,400		21,300		150,000		170,000	
Manganese	µg/L	50 [5]	880	NA		**1,030**		NA		1.7		2	U	1.4	J	0.32	UJ	0.34	UJ	**91**		2.9	
Mercury	µg/L	2.0	11	NA		0.2	U	NA		0.2	U	0.03	U	0.03	U	0.2	U	0.2	U	0.032		0.2	U
Molybdenum	µg/L	--	180	NA		6.3		NA		**2,050**		13		12		14.1		14.4		3.6		2.7	
Nickel	µg/L	--	730	NA		30.9		NA		2		20	U	20	U	1.2		1.2		40	U	2.3	
Potassium	µg/L	--	--	NA		6,910	J	NA		43,500	J	4,800	J	4,600	J	5,570	J	5,730	J	4,800	J	4,550	J
Selenium	µg/L	50	180	NA		21.1		NA		**92.2**		0.89	J	0.71	J	1.1	J	1.7	J	8.5		10.9	
Silver	µg/L	100 [5]	180	NA		0.04	UJ	NA		1	U	0.5	U	0.5	U	1	U	1	U	0.5	U	1	U
Sodium	µg/L	--	--	NA		336,999		NA		240,999		150,000		140,000		152,000		156,000		89,000		87,600	
Thallium	µg/L	2.0	2.4	NA		0.12	UJ	NA		0.37	UJ	***2***	U	***2***	U	0.03	UJ	0.03	UJ	***2***	U	0.01	UJ
Thorium	µg/L	--	--	NA		NA		NA		NA		2	U	2	U	NA		NA		2	U	NA	
Uranium	µg/L	30	7.3	NA		NA		NA		NA		4		4		NA		NA		1.2		NA	
Vanadium	µg/L	--	36	NA		**90**		NA		27.9		5		5.1		6.8		6.9		**39**		**47.6**	
Zinc	µg/L	5,000 [5]	11,000	NA		52.4	J	NA		4.5	J	5	U	5	U	2.2		3.2		13		9	J
Dissolved Aluminum	µg/L	50 [5]	36,000	NA		***200***	U	NA		***200***	U	20	U	20	U	***200***	U	***200***	U	**260**		***200***	U
Dissolved Antimony	µg/L	6.0	15	NA		0.13	UJ	NA		**10.4**		1	U	1	U	0.21	UJ	0.17	UJ	1	U	0.29	UJ
Dissolved Arsenic	µg/L	10	0.045	NA		**5.1**		NA		**31.7**		**5.3**		**5.6**		**3.7**		**3.8**		**2.6**		**3**	
Dissolved Barium	µg/L	2,000	2,600	NA		42.7		NA		34.2		27		27		37.3		42		6.5		4.4	J
Dissolved Beryllium	µg/L	4.0	73	NA		0.03	UJ	NA		1	U	0.5	U	0.5	U	1	U	1	U	0.5	U	0.03	UJ
Dissolved Boron	µg/L	--	7,300	NA		72		NA		160		170		170		156		160		50	J	44.8	
Dissolved Cadmium	µg/L	5.0	18	NA		0.02	J	NA		**8.1**		1	U	1	U	1	U	1	U	1	U	0.05	J
Dissolved Calcium	µg/L	--	--	NA		155,000		NA		123,000		68,000		69,000		96,800		96,600		130,000		125,000	

TABLE 4-16
Groundwater Sampling Laboratory Values for Inorganic and Field Parameters
Monitoring Wells
Remedial Investigation Report
ASARCO LLC Hayden, Arizona Plant Site

The data in this table are illustrated on figures 4-48, 4-49, 4-50, and 4-51.

	Location:	EPA Maximum Contaminant Level[1]	EPA Region IX Preliminary Remediation Goal[2]	GW-01(R)				GW-02				GW-03								GW-06			
	Event:			Winter		Summer		Winter		Summer		Winter		Winter (Duplicate)		Summer		Summer (Duplicate)		Winter		Summer	
	Date:			3/24/06		8/31/06-9/13/06		3/3/06		8/31/06		3/3/06		3/3/06		8/31/06-9/1/06		9/1/06		3/3/06		9/1/06	
Parameter	Units			Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual
Dissolved Chromium	µg/L	100	--	NA		7		NA		7.2		1	U	0.59	J	0.22	UJ	0.21	UJ	7.5		6.8	
Dissolved Cobalt	µg/L	--	730	NA		2.7		NA		0.66	UJ	0.5	U	0.5	U	0.22	UJ	0.18	UJ	3.5		3.4	
Dissolved Copper	µg/L	1,000 [5]	1,500	NA		2	U	NA		2	U	1.9	J	1.7	J	2	U	2	U	8.6		2	U
Dissolved Iron	µg/L	300 [5]	11,000	NA		100	U	NA		100	U	100	U	100	U	100	UJ	100	UJ	250		100	U
Dissolved Lead	µg/L	15	--	NA		0.07	UJ	NA		0.1	UJ	2	U	2	U	0.08	UJ	0.06	UJ	2	U	0.06	UJ
Dissolved Magnesium	µg/L	--	--	NA		155,000		NA		54,000		14,000		15,000		20,400		20,500		160,000		171,000	
Dissolved Manganese	µg/L	50 [5]	880	NA		**298**		NA		1.4		2	U	2	U	0.63	J	0.36	J	24		0.3	UJ
Dissolved Mercury	µg/L	2.0	11	NA		0.2	U	NA		0.2	U	0.03	U	0.03	U	0.2	U	0.2	U	0.03	U	0.2	U
Dissolved Molybdenum	µg/L	--	180	NA		13.9		NA		**2,030**		13		13		12.3		12.9		4.8		2.4	
Dissolved Nickel	µg/L	--	730	NA		7.4		NA		5.7		20	U	20	U	1.2		1.3		40	U	5	
Dissolved Potassium	µg/L	--	--	NA		4,390	J	NA		42,200	J	4,800	J	4,900	J	5,940	J	6,080	J	5,100		4,900	J
Dissolved Selenium	µg/L	50	180	NA		30.4		NA		**97.2**		0.99	J	0.84	J	0.95	J	1.1	J	9.6		13.6	
Dissolved Silver	µg/L	100 [5]	180	NA		1	U	NA		1	U	0.5	U	0.5	U	1	U	1	U	0.5	U	0.02	UJ
Dissolved Sodium	µg/L	--	--	NA		315,999		NA		233,000		120,000		130,000		156,999		159,999		85,000		90,200	
Dissolved Thallium	µg/L	2.0	2.4	NA		1	U	NA		0.39	J	***2***	U	***2***	U	0.03	UJ	0.02	UJ	***2***	U	1	U
Dissolved Thorium	µg/L	--	--	NA		NA		NA		NA		2	U	2	U	NA		NA		2	U	NA	
Dissolved Uranium	µg/L	30	7.3	NA		NA		NA		NA		4		4		NA		NA		1.1		NA	
Dissolved Vanadium	µg/L	--	36	NA		**46.2**		NA		24.6		4.6		4.5		6.8		7.1		35		**36.5**	
Dissolved Zinc	µg/L	5,000 [5]	11,000	NA		4.5	J	NA		7.5	J	5	U	5	U	2.9		3.4		3.4	J	7.1	J
pH		<6.5 or >8.5 [5]	--	**12.13**		6.79		**11.67**		7.01		7.95		NA		7.22		NA		7.95		7.24	
Conductivity	mS/cm	--	--	0.62		4.36		2.97		3.03		0.94		NA		1.33		NA		2.22		2.17	

TABLE 4-16
Groundwater Sampling Laboratory Values for Inorganic and Field Parameters
Monitoring Wells
Remedial Investigation Report
ASARCO LLC Hayden, Arizona Plant Site

The data in this table are illustrated on figures 4-48, 4-49, 4-50, and 4-51.

	Location:	EPA Maximum Contaminant Level[1]	EPA Region IX Preliminary Remediation Goal[2]	ARU-1				ARU-8				H-1				H-2A				H-3			
	Event:			Winter		Summer		Winter		Summer		Winter		Summer		Winter		Summer		Winter		Summer	
	Date:			3/2/06		8/29/06		3/2/06		8/29/06		2/28/06		9/13/06		2/28/06		9/13/06		2/28/06		8/29/06	
Parameter	Units			Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual
Aluminum	µg/L	50 [5]	36,000	**320**		***50***	UJ	20		19.7	UJ	19	J	***200***	U	20	U	***200***	U	**720**		***79.4***	UJ
Antimony	µg/L	6.0	15	1	U	2	U	1	U	0.09	UJ	1	U	0.09	UJ	1	U	2	U	1	U	0.17	UJ
Arsenic	µg/L	10	0.045	**0.67**	J	**0.89**	J	**13**		**10**		**6.5**		**4.7**		**4.9**		**3.8**		**2.9**		**1.9**	
Barium	µg/L	2,000	2,600	5.8		2.1	J	24		28.1		32		50.5		35		37.2		43		25.7	
Beryllium	µg/L	4.0	73	0.5	U	0.05	UJ	0.5	U	1	U	0.5	U	0.04	UJ	1	U	2	U	1	U	0.02	UJ
Boron	µg/L	--	7,300	52	J	63.2		310		342		120		143		100		112		600		528	
Cadmium	µg/L	5.0	18	1	U	1	U	1	U	1	U	1	U	0.28	UJ	1	U	0.27	J	1	U	0.06	J
Calcium	µg/L	--	--	5,700		2,940	J	82,000		85,300		450,000		678,000		380,000		387,000		190,000		152,000	
Chromium	µg/L	100	--	17		18.5		0.96	J	0.68	J	1	U	0.2	UJ	1	U	0.12	J	0.97	J	1.1	J
Cobalt	µg/L	--	730	0.53		0.15	UJ	0.28	J	0.18	UJ	4.7		8.7		4.3		5.7		1.3		0.66	UJ
Copper	µg/L	1,000 [5]	1,500	15		2.6	J	2.2		2	UJ	3.4		7.8		3		4	U	21		2	UJ
Cyanide	µg/L	200	730	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U
Iron	µg/L	300 [5]	11,000	**1,400**		**780**		100	U	100	U	**920**		**513**		**820**		**411**		**780**		100	U
Lead	µg/L	15	--	2	U	0.39	UJ	2	U	0.07	UJ	2	U	0.12	UJ	2	U	0.13	UJ	2	U	0.22	UJ
Magnesium	µg/L	--	--	790		598	UJ	20,000		20,000		100,000		153,999		86,000		84,800		98,000		75,800	
Manganese	µg/L	50 [5]	880	**77**		**51.1**		2.1		1.3		**6,500**		**7,330**		**7,200**		**5,250**		**300**		34.3	
Mercury	µg/L	2.0	11	0.037		0.2	U	0.03	U	0.2	U	0.03	U	0.2	U	0.03	U	0.2	U	0.06		0.2	U
Molybdenum	µg/L	--	180	1.1		2		36		41.9		18		25		16		9.8		2.5		9.2	
Nickel	µg/L	--	730	20	U	0.35	J	20	U	0.89	J	40	U	27.3		40	U	16.8		40	U	2.7	
Potassium	µg/L	--	--	5,000	U	1,160	J	5,400		5,360	J	10,000		14,300	J	8,800		9,210	J	4,400	J	4,030	J
Selenium	µg/L	50	180	0.8	J	1.7	J	1.7		1.6	J	2	U	5.9		2	U	4.5	J	1.5	J	2.9	J
Silver	µg/L	100 [5]	180	0.5	U	1	U	0.5	U	1	U	0.5	U	0.01	UJ	0.5	U	2	U	0.5	U	0.03	UJ
Sodium	µg/L	--	--	70,000		75,800		210,000		198,000		270,000		324,999		250,000		218,000		680,000		500,000	
Thallium	µg/L	2.0	2.4	***2***	U	1	U	***2***	U	1	U	***2***	U	0.08	UJ	**2**	U	0.05	UJ	***2***	U	0.03	UJ
Thorium	µg/L	--	--	2	U	NA		2	U	NA		2	U	NA		2	U	NA		2	U	NA	
Uranium	µg/L	30	7.3	**7.3**		NA		7.1		NA		1.4		NA		1.6		NA		**21**		NA	
Vanadium	µg/L	--	36	4	U	3.1		8.5		11.4		5.1		5.2		4	U	1.7	J	10		10.2	
Zinc	µg/L	5,000 [5]	11,000	4.7	J	2.9	J	2.8	J	11.2	J	3.4	J	3.6		3.1	J	3.2	J	8.2		12.1	J
Dissolved Aluminum	µg/L	50 [5]	36,000	20	U	***200***	U	20	U	***200***	U	20	U	27.2	UJ	20	U	20.8	UJ	20	U	***200***	U
Dissolved Antimony	µg/L	6.0	15	1	U	2	U	1	U	0.12	UJ	1	U	0.1	UJ	1	U	2	U	1	U	0.12	UJ
Dissolved Arsenic	µg/L	10	0.045	**1.1**		***0.89***	UJ	**12**		**9.2**		**6.4**		**4.7**		**5.1**		**3.6**		**2.8**		**2.5**	
Dissolved Barium	µg/L	2,000	2,600	15		0.79	J	23		29.6		33		57.3	J	36		34.9	J	30		22.1	
Dissolved Beryllium	µg/L	4.0	73	0.5	U	1	U	0.5	U	1	U	1	U	0.09	UJ	1	U	2	U	1	U	2	U
Dissolved Boron	µg/L	--	7,300	100	U	49		300		214		130		161		110		109		580		510	
Dissolved Cadmium	µg/L	5.0	18	1	U	1	U	1	U	1	U	1	U	0.2	UJ	1	U	0.09	J	1	U	0.07	J
Dissolved Calcium	µg/L	--	--	130,000		2,730	J	82,000		83,200		470,000		731,000		390,000		396,999		190,000		147,999	

TABLE 4-16
Groundwater Sampling Laboratory Values for Inorganic and Field Parameters
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ASARCO LLC Hayden, Arizona Plant Site

The data in this table are illustrated on figures 4-48, 4-49, 4-50, and 4-51.

	Location:	EPA Maximum Contaminant Level[1]	EPA Region IX Preliminary Remediation Goal[2]	ARU-1				ARU-8				H-1				H-2A				H-3			
	Event:			Winter		Summer		Winter		Summer		Winter		Summer		Winter		Summer		Winter		Summer	
	Date:			3/2/06		8/29/06		3/2/06		8/29/06		2/28/06		9/13/06		2/28/06		9/13/06		2/28/06		8/29/06	
Parameter	Units			Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual
Dissolved Chromium	µg/L	100	--	3.7		11.9		1		0.38	J	2	U	0.09	UJ	1	U	4	U	1	U	0.17	UJ
Dissolved Cobalt	µg/L	--	730	4		0.07	UJ	0.34	J	0.41	UJ	4.5		9.2		4.4		5.6		2.5		2	U
Dissolved Copper	µg/L	1,000 [5]	1,500	2.7		0.08	UJ	2		2	U	2.4		7.8		2.6		4	U	6.2		4	U
Dissolved Iron	µg/L	300 [5]	11,000	66	J	160		100	U	100	U	**950**		**487**		**840**		**374**		100	U	100	U
Dissolved Lead	µg/L	15	--	2	U	0.1	UJ	2	U	0.08	UJ	2	U	0.16	J	2	U	0.08	UJ	2	U	0.05	UJ
Dissolved Magnesium	µg/L	--	--	140,000		636	J	20,000		22,000		100,000		158,000		89,000		85,500		95,000		82,800	
Dissolved Manganese	µg/L	50 [5]	880	12		4		1.6	J	0.45	UJ	**6,700**		**7,250**		**7,300**		**5,150**		36		12.3	
Dissolved Mercury	µg/L	2.0	11	0.03	U	0.2	U	0.03	U	0.2	U	0.015	J	0.2	U	0.03	U	0.2	U	0.022	J	0.2	U
Dissolved Molybdenum	µg/L	--	180	2		2.1		35		33.2		19		25.7		17		9.3		12		4.6	
Dissolved Nickel	µg/L	--	730	40	U	0.26	J	20	U	3		50	U	34		40	U	16.6		20	U	0.17	J
Dissolved Potassium	µg/L	--	--	5,800		1,360	J	5,400		6,030	J	11,000		15,400	J	9,000		8,940	J	4,300	J	4,530	J
Dissolved Selenium	µg/L	50	180	4.8		2.3	UJ	1.6		3.4	UJ	2	U	6.5		2	U	4.4	J	1.8	J	5.8	J
Dissolved Silver	µg/L	100 [5]	180	0.5	U	1	U	0.5	U	1	U	0.5	U	1	U	0.5	U	2	U	0.5	U	2	U
Dissolved Sodium	µg/L	--	--	120,000		80,800		170,000		207,000		280,000		345,000		260,000		216,000		650,000		521,000	
Dissolved Thallium	µg/L	2.0	2.4	***2***	U	1	U	***2***	U	1	U	***2***	U	0.08	UJ	***2***	U	0.04	UJ	***2***	U	1	U
Dissolved Thorium	µg/L	--	--	2	U	NA		2	U	NA		2	U	NA		2	U	NA		2	U	NA	
Dissolved Uranium	µg/L	30	7.3	0.55		NA		7.1		NA		1.4		NA		1.7		NA		**21**		NA	
Dissolved Vanadium	µg/L	--	36	27		2.9		7.5		10		4.8		4.5		4	U	1.5	J	7.1		8.7	
Dissolved Zinc	µg/L	5,000 [5]	11,000	5.7		8.2	J	3.3	J	3.3	J	3.4	J	4.1		3.1	J	2.9	J	5.9		8.5	J
pH		<6.5 or >8.5 [5]	--	7.93		**9.1**		7.88		7.79		7.51		6.82		7.54		6.96		7.18		7.67	
Conductivity	mS/cm	--	--	0.35		313		1.64		1.28		3.34		4.49		3		2.84		3.6		2.1	

TABLE 4-16
Groundwater Sampling Laboratory Values for Inorganic and Field Parameters
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The data in this table are illustrated on figures 4-48, 4-49, 4-50, and 4-51.

	Location:	EPA Maximum Contaminant Level[1]	EPA Region IX Preliminary Remediation Goal[2]	H-4				H-4				H-5				H-6				H-7		H-8			
	Event:			Winter		Summer		Winter		Summer		Winter		Summer		Winter		Summer		Summer		Winter		Summer	
	Date:			2/28/06		8/29/06		2/28/06		8/29/06		2/28/06		9/13/06		2/27/06		8/29/06		8/30/06		2/28/06		8/30/06	
Parameter	Units			Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual
Aluminum	µg/L	50 [5]	36,000	38		***200***	U	38		***200***	U	20	U	23.7	UJ	20	U	***200***	U	**815**		**100**		**383**	
Antimony	µg/L	6.0	15	1	U	0.11	UJ	1	U	0.11	UJ	1	U	0.12	UJ	1.1		1.1	UJ	0.21	UJ	1	U	0.44	UJ
Arsenic	µg/L	10	0.045	**16**		**6.4**		**16**		**6.4**		**7.4**		**4.9**		**7.1**		**7.9**		**231**		**7.5**		**7.6**	
Barium	µg/L	2,000	2,600	60		45.2		60		45.2		56		177		23		36.4		7.6	UJ	34		39.3	
Beryllium	µg/L	4.0	73	0.5	U	1	U	0.5	U	1	U	0.5	U	0.03	UJ	0.5	U	1	U	1	U	1	U	1	U
Boron	µg/L	--	7,300	310		316		310		316		140		193		120		190		679		160		130	
Cadmium	µg/L	5.0	18	1	U	0.03	J	1	U	0.03	J	1	U	0.04	UJ	1	U	1	U	1	U	1	U	0.08	J
Calcium	µg/L	--	--	94,000		93,900		94,000		93,900		63,000		206,000		58,000		70,500		6,710		130,000		170,000	
Chromium	µg/L	100	--	1	U	0.38	J	1	U	0.38	J	1	U	0.27	UJ	1		0.36	J	18.1		9.9		3	
Cobalt	µg/L	--	730	0.74		0.4	UJ	0.74		0.4	UJ	0.61		1.6		0.7		0.24	UJ	0.79	UJ	1.6		1.2	
Copper	µg/L	1,000 [5]	1,500	5.1		2	UJ	5.1		2	UJ	3.5		6.3		2.9		2	UJ	4.6	J	10		11.7	J
Cyanide	µg/L	200	730	10	U	10	U	10	U	10	U	10	U	10	U	NA		10	U	10	U	10	U	10	U
Iron	µg/L	300 [5]	11,000	**1,300**		100	U	**1,300**		100	U	140		**404**		100	U	100	U	**623**		210		145	
Lead	µg/L	15	--	2	U	0.07	UJ	2	U	0.07	UJ	2	U	0.11	UJ	2	U	0.03	UJ	0.57	UJ	2	U	0.42	UJ
Magnesium	µg/L	--	--	22,000		22,900		22,000		22,900		16,000		51,600		18,000		20,200		1,510	UJ	170,000		59,500	
Manganese	µg/L	50 [5]	880	**270**		**75.1**		**270**		**75.1**		**850**		**2,190**		3.7		5.2		19.5		26		40.8	
Mercury	µg/L	2.0	11	0.019	J	0.2	U	0.019	J	0.2	U	0.03	U	0.2	U	0.03	U	0.2	U	0.2	U	0.019	J	0.2	U
Molybdenum	µg/L	--	180	2.9		26.5		2.9		26.5		15		18.5		65		65.9		3.5		30		**300**	
Nickel	µg/L	--	730	20	U	2		20	U	2		10	U	8.4		10	U	1.2		3.5		40	U	3.8	
Potassium	µg/L	--	--	5,900		5,350	J	5,900		5,350	J	5,500		9,870	J	4,900	J	6,680	J	1,390	J	10,000		7,390	J
Selenium	µg/L	50	180	2	U	1.3	J	2	U	1.3	J	2	U	3.1	J	2	U	13.1		2.9	J	**100**		35	
Silver	µg/L	100 [5]	180	0.5	U	1	U	0.5	U	1	U	0.5	U	1	U	0.5	U	1	U	1	U	0.5	U	0.02	UJ
Sodium	µg/L	--	--	270,000		233,000		270,000		233,000		190,000		285,000		130,000		156,000		228,000		360,000		128,000	
Thallium	µg/L	2.0	2.4	***2***	U	1	U	***2***	U	1	U	***2***	U	0.05	UJ	***2***	U	1	U	0.01	UJ	***2***	U	1	U
Thorium	µg/L	--	--	2	U	NA		2	U	NA		2	U	NA		2	U	NA		NA		2	U	NA	
Uranium	µg/L	30	7.3	**8.5**		NA		**8.5**		NA		1.6		NA		3		NA		NA		5.2		NA	
Vanadium	µg/L	--	36	8		7.2		8		7.2		4	U	0.75	UJ	3.8	J	9.8		**598**		**70**		**60.7**	
Zinc	µg/L	5,000 [5]	11,000	4.4	J	6.3	J	4.4	J	6.3	J	5	U	2.5		5	U	2.1	J	4.6	J	5.8		5.6	J
Dissolved Aluminum	µg/L	50 [5]	36,000	20	U	***200***	U	20	U	***200***	U	20	U	31.2	UJ	20	U	***200***	U	40.3	J	20	U	***200***	U
Dissolved Antimony	µg/L	6.0	15	1	U	0.19	UJ	1	U	0.19	UJ	1	U	2	U	0.97	J	1.2	UJ	0.22	UJ	1	U	0.5	UJ
Dissolved Arsenic	µg/L	10	0.045	**6.9**		**5.9**		**6.9**		**5.9**		**6.7**		**4.8**		**7.2**		**6.8**		**199**		**7**		**6.2**	
Dissolved Barium	µg/L	2,000	2,600	42		48.7		42		48.7		54		191	J	24		38.3		2.9	J	33		35	
Dissolved Beryllium	µg/L	4.0	73	0.5	U	0.05	UJ	0.5	U	0.05	UJ	0.5	U	0.02	UJ	0.5	U	0.08	UJ	1	U	1	U	0.04	UJ
Dissolved Boron	µg/L	--	7,300	300		177		300		177		140		201		120		153		430		160		83.2	
Dissolved Cadmium	µg/L	5.0	18	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Dissolved Calcium	µg/L	--	--	92,000		87,600		92,000		87,600		62,000		210,000		59,000		66,800		6,320		140,000		165,999	

TABLE 4-16
Groundwater Sampling Laboratory Values for Inorganic and Field Parameters
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The data in this table are illustrated on figures 4-48, 4-49, 4-50, and 4-51.

	Location:	EPA Maximum Contaminant Level[1]	EPA Region IX Preliminary Remediation Goal[2]	H-4				H-4				H-5				H-6				H-7		H-8			
	Event:			Winter		Summer		Winter		Summer		Winter		Summer		Winter		Summer		Summer		Winter		Summer	
	Date:			2/28/06		8/29/06		2/28/06		8/29/06		2/28/06		9/13/06		2/27/06		8/29/06		8/30/06		2/28/06		8/30/06	
Parameter	Units			Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual
Dissolved Chromium	µg/L	100	--	1	U	2	U	1	U	2	U	1	U	0.14	UJ	1	U	0.08	J	11.9		8.1		0.54	UJ
Dissolved Cobalt	µg/L	--	730	2.4		0.5	UJ	2.4		0.5	UJ	0.51		1.7		0.45	J	0.38	UJ	0.15	UJ	1.3		0.99	UJ
Dissolved Copper	µg/L	1,000 [5]	1,500	2.9		2	U	2.9		2	U	2.4		5.6		2.6		2	U	0.76	UJ	9.7		6.2	
Dissolved Iron	µg/L	300 [5]	11,000	100	U	100	U	100	U	100	U	110		**373**		100	U	100	U	100	U	100	U	100	U
Dissolved Lead	µg/L	15	--	2	U	0.06	UJ	2	U	0.06	UJ	2	U	0.1	UJ	2	U	0.05	UJ	0.05	UJ	2	U	0.04	UJ
Dissolved Magnesium	µg/L	--	--	22,000		24,400		22,000		24,400		16,000		51,300		18,000		21,600		1,390	J	170,000		58,700	
Dissolved Manganese	µg/L	50 [5]	880	9.7		37.4		9.7		37.4		**820**		**2,190**		1.6	J	3.7		1.1		7.6		9.5	
Dissolved Mercury	µg/L	2.0	11	0.018	J	0.2	U	0.018	J	0.2	U	0.017	J	0.2	U	0.03	U	0.2	U	0.2	U	0.03	U	0.2	U
Dissolved Molybdenum	µg/L	--	180	14		27.6		14		27.6		14		20.3		66		61.1		3.3		31		**259**	
Dissolved Nickel	µg/L	--	730	10	U	3.6		10	U	3.6		10	U	9.2		10	U	2.8		0.98	J	20	U	6.1	
Dissolved Potassium	µg/L	--	--	6,000		5,830	J	6,000		5,830	J	5,400		9,350	J	5,000		7,130	J	1,370	J	10,000		7,310	J
Dissolved Selenium	µg/L	50	180	2	U	2.7	UJ	2	U	2.7	UJ	2	U	4	J	2	U	13.6		4.2	UJ	**100**		31	
Dissolved Silver	µg/L	100 [5]	180	0.5	U	1	U	0.5	U	1	U	0.5	U	1	U	0.5	U	1	U	1	U	0.5	U	1	U
Dissolved Sodium	µg/L	--	--	260,000		240,000		260,000		240,000		190,000		279,000		130,000		164,000		213,000		360,000		119,000	
Dissolved Thallium	µg/L	2.0	2.4	***2***	U	1	U	***2***	U	1	U	***2***	U	0.03	UJ	***2***	U	1	U	1	U	***2***	U	1	U
Dissolved Thorium	µg/L	--	--	2	U	NA		2	U	NA		2	U	NA		2	U	NA		NA		2	U	NA	
Dissolved Uranium	µg/L	30	7.3	**8.5**		NA		**8.5**		NA		1.6		NA		2.9		NA		NA		5.3		NA	
Dissolved Vanadium	µg/L	--	36	4.4		6.4		4.4		6.4		4	U	0.71	UJ	3.5	J	8.1		**505**		**85**		**45**	
Dissolved Zinc	µg/L	5,000 [5]	11,000	4.2	J	5.4	J	4.2	J	5.4	J	5	U	2.5		5	U	7.5	J	6	J	4.6	J	4.9	J
pH		<6.5 or >8.5 [5]	--	7.3		7.79		7.3		7.79		7.58		7.35		NA		7.7		**9.25**		7.87		7.74	
Conductivity	mS/cm	--	--	2.72		1.58		2.72		1.58		1.21		2.49		NA		10.7		0.831		3.16		1.34	

TABLE 4-16
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ASARCO LLC Hayden, Arizona Plant Site

The data in this table are illustrated on figures 4-48, 4-49, 4-50, and 4-51.

	Location:	EPA Maximum Contaminant Level[1]	EPA Region IX Preliminary Remediation Goal[2]	H-9								H-10				H-11				LC-1			
	Event:			Winter		Winter (Duplicate)		Summer		Summer (Duplicate)		Winter		Summer		Winter		Summer		Winter		Summer	
	Date:			2/28/06		2/28/06		8/30/06		8/30/06		2/27/06		8/29/06		2/28/06		9/13/06		2/28/06		8/30/06	
Parameter	Units			Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual
Aluminum	µg/L	50 [5]	36,000	NA		20	U	31.1	UJ	30.6	UJ	20	U	***200***	U	10	J	***200***	U	**1,300**		**3,070**	
Antimony	µg/L	6.0	15	NA		1	U	0.09	UJ	0.08	UJ	1	U	0.06	UJ	1	U	0.1	UJ	1	U	2	U
Arsenic	µg/L	10	0.045	NA		**6.4**		**6.6**		**7.4**		**5.2**		**5.8**		**6.2**		**6.5**		**8**		**21.9**	
Barium	µg/L	2,000	2,600	NA		33		37.1		39.6		74		78		39		46.9		9.6		12.7	
Beryllium	µg/L	4.0	73	NA		1	U	0.02	UJ	1	U	0.5	U	1	U	0.5	U	1	U	0.27	J	0.04	UJ
Boron	µg/L	--	7,300	NA		240		262		234		180		175		180		231		89	J	111	
Cadmium	µg/L	5.0	18	NA		1	U	0.03	J	0.05	J	1	U	1	U	1	U	0.09	UJ	2.2		2.1	
Calcium	µg/L	--	--	NA		460,000		522,000		525,000		110,000		96,900		170,000		177,999		110,000		111,000	
Chromium	µg/L	100	--	NA		1.9		1.3	J	1.5	J	0.53	J	0.57	J	16		11.5		12		5.4	
Cobalt	µg/L	--	730	NA		5.2		4.6		4.4		0.25	J	0.57	UJ	0.71		0.86	UJ	2.7		2.7	
Copper	µg/L	1,000 [5]	1,500	NA		12		2	UJ	1.8	UJ	3.9		2	UJ	6.2		4.1		15		25.7	J
Cyanide	µg/L	200	730	10	U	10	U	10	U	2.5	J	NA		10	U	10	U	10	U	11		10	U
Iron	µg/L	300 [5]	11,000	NA		100	U	100	U	100	U	100	U	100	U	100	U	100	U	**910**		**4,130**	
Lead	µg/L	15	--	NA		2	U	0.07	UJ	0.06	UJ	2	U	0.03	UJ	2	U	0.24	UJ	3.1		1.4	
Magnesium	µg/L	--	--	NA		190,000		234,999		236,000		35,000		30,500		64,000		59,700		110,000		140,000	
Manganese	µg/L	50 [5]	880	NA		**460**		**485**		**492**		**320**		**767**		28		2		**80**		**74.9**	
Mercury	µg/L	2.0	11	NA		0.023	J	0.2	U	0.2	U	0.02	J	0.2	U	0.016	J	0.2	U	0.024	J	0.2	U
Molybdenum	µg/L	--	180	NA		76		85.7		87.6		0.58		3		43		41.3		**510**		**517**	
Nickel	µg/L	--	730	NA		50	U	7.4		7.3		10	U	1.8		20	U	6.5		40	U	4.1	
Potassium	µg/L	--	--	NA		7,600		8,950	J	9,000	J	6,900		5,850	J	6,000		5,820	J	4,400	J	5,180	J
Selenium	µg/L	50	180	NA		**56**		46.6		47.2		4.4		6		11		15.2		**480**		**781**	
Silver	µg/L	100 [5]	180	NA		0.5	U	1	U	1	U	0.5	U	1	U	0.5	U	1	U	0.5	U	0.02	UJ
Sodium	µg/L	--	--	NA		340,000		323,000		324,000		190,000		152,000		240,000		233,000		490,000		461,000	
Thallium	µg/L	2.0	2.4	NA		***2***	U	1	U	1	U	***2***	U	1	U	***2***	U	0.03	UJ	***2***	U	0.01	UJ
Thorium	µg/L	--	--	NA		2	U	NA		NA		2	U	NA		2	U	NA		2	U	NA	
Uranium	µg/L	30	7.3	NA		**9.8**		NA		NA		2.5		NA		3.6		NA		0.58		NA	
Vanadium	µg/L	--	36	NA		33		**48.1**		**47.8**		2	J	5.4		19		24.7		**48**		**53.4**	
Zinc	µg/L	5,000 [5]	11,000	NA		3.9	J	6.4	J	14.1	J	2.9	J	12	J	2.5	J	4.5		33		39.8	J
Dissolved Aluminum	µg/L	50 [5]	36,000	20	U	NA		***200***	U	***200***	U	20	U	***200***	U	20	U	***200***	U	**66**		***200***	U
Dissolved Antimony	µg/L	6.0	15	1	U	NA		0.11	UJ	0.1	UJ	1	U	0.11	UJ	1	U	0.12	UJ	1	U	0.07	UJ
Dissolved Arsenic	µg/L	10	0.045	**6.5**		NA		**6.5**		**6.9**		**5**		**5.3**		**6.1**		**5.5**		**7.6**		**5**	
Dissolved Barium	µg/L	2,000	2,600	34		NA		38		40.5		64		75.5		37		44.5	J	5.6		6.4	UJ
Dissolved Beryllium	µg/L	4.0	73	1	U	NA		0.05	UJ	0.06	UJ	0.5	U	0.04	UJ	0.5	U	1	U	1	U	0.03	UJ
Dissolved Boron	µg/L	--	7,300	240		NA		138		150		180		145		180		238		87	J	67.2	
Dissolved Cadmium	µg/L	5.0	18	1	U	NA		1	U	0.04	J	1	U	0.03	J	1	U	0.06	UJ	1	U	1	U
Dissolved Calcium	µg/L	--	--	450,000		NA		471,999		483,999		110,000		94,200		170,000		182,000		97,000		94,400	

TABLE 4-16
Groundwater Sampling Laboratory Values for Inorganic and Field Parameters
Monitoring Wells
Remedial Investigation Report
ASARCO LLC Hayden, Arizona Plant Site

The data in this table are illustrated on figures 4-48, 4-49, 4-50, and 4-51.

	Location:	EPA Maximum Contaminant Level[1]	EPA Region IX Preliminary Remediation Goal[2]	H-9								H-10				H-11				LC-1			
	Event:			Winter		Winter (Duplicate)		Summer		Summer (Duplicate)		Winter		Summer		Winter		Summer		Winter		Summer	
	Date:			2/28/06		2/28/06		8/30/06		8/30/06		2/27/06		8/29/06		2/28/06		9/13/06		2/28/06		8/30/06	
Parameter	Units			Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual
Dissolved Chromium	µg/L	100	--	1.9		NA		0.81	UJ	0.83	UJ	1	U	0.18	J	16		10.4		2.7		2.1	
Dissolved Cobalt	µg/L	--	730	4.4		NA		5.3		5.3		0.5	U	0.58	UJ	0.68		0.87	UJ	0.72		1	U
Dissolved Copper	µg/L	1,000 [5]	1,500	15		NA		0.93	UJ	0.35	UJ	3.4		2	U	5.5		4.8		29		2	U
Dissolved Iron	µg/L	300 [5]	11,000	100	U	NA		100	U	100	U	100	U	100	U	100	U	100	U	100		100	U
Dissolved Lead	µg/L	15	--	2	U	NA		0.06	UJ	0.04	UJ	2	U	0.06	UJ	2	U	0.13	UJ	2	U	0.05	UJ
Dissolved Magnesium	µg/L	--	--	190,000		NA		225,999		230,000		35,000		33,700		65,000		62,300		110,000		129,999	
Dissolved Manganese	µg/L	50 [5]	880	**450**		NA		**344**		**353**		**68**		**154**		25		0.46	UJ	8.2		6.6	
Dissolved Mercury	µg/L	2.0	11	0.02	J	NA		0.2	U	0.2	U	0.03	U	0.2	U	0.03	U	0.2	U	0.018	J	0.2	U
Dissolved Molybdenum	µg/L	--	180	77		NA		75.1		77.5		5.3		5.5		42		39.9		**540**		**533**	
Dissolved Nickel	µg/L	--	730	40	U	NA		18.1		17.8		10	U	4		20	U	6.7		10	U	4	
Dissolved Potassium	µg/L	--	--	7,600		NA		8,750	J	8,790	J	6,700		6,410	J	6,200		6,390	J	4,300	J	4,600	J
Dissolved Selenium	µg/L	50	180	**57**		NA		49.1		49.1		4		7.8		11		13.7		**500**		**677**	
Dissolved Silver	µg/L	100 [5]	180	0.5	U	NA		0.01	UJ	0.02	UJ	0.5	U	1	U	0.5	U	1	U	0.5	U	1	U
Dissolved Sodium	µg/L	--	--	350,000		NA		309,000		315,999		190,000		159,999		270,000		249,999		510,000		414,999	
Dissolved Thallium	µg/L	2.0	2.4	***2***	U	NA		1	U	1	U	***2***	U	1	U	***2***	U	0.02	UJ	***2***	U	1	U
Dissolved Thorium	µg/L	--	--	2	U	NA		NA		NA		2	U	NA		2	U	NA		2	U	NA	
Dissolved Uranium	µg/L	30	7.3	**9.7**		NA		NA		NA		2.3		NA		3.7		NA		0.48	J	NA	
Dissolved Vanadium	µg/L	--	36	**42**		NA		35.7		35.7		4	U	4.4		18		23.5		**51**		**40.5**	
Dissolved Zinc	µg/L	5,000 [5]	11,000	4.3	J	NA		5.9	J	4	J	7.9		7.6	J	2.5	J	3.7		5.9		5.8	J
pH		<6.5 or >8.5 [5]	--	6.85		NA		7.53		NA		NA		7.44		7.56		7.03		7.5		8.28	
Conductivity	mS/cm	--	--	4.01		NA		3.81		NA		NA		1.28		2.2		2.29		2.78		2.74	

TABLE 4-16
Groundwater Sampling Laboratory Values for Inorganic and Field Parameters
Monitoring Wells
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The data in this table are illustrated on figures 4-48, 4-49, 4-50, and 4-51.

	Location:	EPA Maximum Contaminant Level[1]	EPA Region IX Preliminary Remediation Goal[2]	MW-2				MW-4				S-4A				SM-2		Equipment Blank		Equipment Blank		Equipment Blank (ASARCO)[3]	
	Event:			Winter		Summer		Winter		Summer		Winter		Summer		Summer		Winter		Winter		Summer	
	Date:			3/2/06		8/30/06		3/2/06		8/30/06		2/28/06		8/29/06		9/1/06		2/23/06		3/3/06		8/29/06	
Parameter	Units			Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual
Aluminum	µg/L	50 [5]	36,000	NA		24.9	UJ	20	U	***200***	U	20	U	***200***	U	**909**	J	***200***	U	20	U	44.8	UJ
Antimony	µg/L	6.0	15	NA		2	U	1	U	2	U	1	U	0.09	UJ	0.86	UJ	***60***	U	1	U	0.07	UJ
Arsenic	µg/L	10	0.045	NA		**1.7**		**4.6**		**5.8**		**4.9**		**3.8**		**43.7**		***10***	U	***1***	U	***0.31***	J
Barium	µg/L	2,000	2,600	NA		15.1		9.2		10.5		27		35.2		83.2	J	200	U	1	U	0.35	UJ
Beryllium	µg/L	4.0	73	NA		1	U	0.5	U	1	U	0.5	U	1	U	0.11	UJ	***5***	U	0.5	U	1	U
Boron	µg/L	--	7,300	NA		56.1		54	J	65.5		130		132		141		1		58	J	7.1	
Cadmium	µg/L	5.0	18	NA		1	U	1	U	1	U	1	U	1	U	0.93	UJ	***5***	U	1	U	0.02	J
Calcium	µg/L	--	--	NA		138,999		130,000		120,999		91,000		91,700		398,000		5,000	U	140		411	J
Chromium	µg/L	100	--	NA		9.9		11		15.6		0.95	J	0.8	J	23.1		10	U	1	U	0.6	J
Cobalt	µg/L	--	730	NA		0.35	UJ	0.42	J	0.47	UJ	0.5	U	0.18	UJ	3.4		50	U	0.5	U	0.13	UJ
Copper	µg/L	1,000 [5]	1,500	NA		0.89	UJ	8.8		9.2	J	1.4	J	2	UJ	118		25	U	2	U	8.9	J
Cyanide	µg/L	200	730	NA		10	U	10	U	10	U	10	U	10	U	10	U	NA		10	U	10	U
Iron	µg/L	300 [5]	11,000	NA		**3,130**		**1,800**		**2,810**		100	U	100	U	**1,780**	J	100	U	100	U	100	U
Lead	µg/L	15	--	NA		0.71	UJ	1	J	2.1		2	U	0.04	UJ	6.7		10	U	2	U	0.1	UJ
Magnesium	µg/L	--	--	NA		155,000		210,000		207,000		16,000		15,900		183,000		5,000	U	500	U	64.4	UJ
Manganese	µg/L	50 [5]	880	NA		31.3		40		43.2		2	U	1	U	**55.6**		15	U	2	U	3.6	
Mercury	µg/L	2.0	11	NA		0.2	U	0.03	U	0.2	U	0.03	U	0.2	U	0.047	J	0.2	U	0.03	U	0.2	U
Molybdenum	µg/L	--	180	NA		2.8		1.1		1.2		16		17.4		**426**		NA		0.26	J	0.16	
Nickel	µg/L	--	730	NA		2.3		40	U	3.5		10	U	1.1		9.3		40	U	1	U	0.25	J
Potassium	µg/L	--	--	NA		5,910	J	6,100		5,640	J	4,200	J	3,640	J	8,650	J	5,000	U	5,000	U	5,000	UJ
Selenium	µg/L	50	180	NA		5.7		**55**		**58.4**		2.2		1.1	J	**56.1**		35	U	1	U	5	U
Silver	µg/L	100 [5]	180	NA		1	U	0.5	U	1	U	0.5	U	1	U	3.1		10	U	0.5	U	1	U
Sodium	µg/L	--	--	NA		153,000		64,000		72,200		110,000		93,900		336,000		124	J	2,100		5,000	U
Thallium	µg/L	2.0	2.4	NA		1	U	***2***	U	1	U	***2***	U	1	U	0.04	UJ	***25***	U	***2***	U	1	U
Thorium	µg/L	--	--	NA		NA		2	U	NA		2	U			NA		NA		2	U	NA	
Uranium	µg/L	30	7.3	NA		NA		1.1		NA		3.8				NA		NA		0.5	U	NA	
Vanadium	µg/L	--	36	NA		**56**		**49**		**63.4**		4		8.4		16.6		***50***	U	4	U	0.57	UJ
Zinc	µg/L	5,000 [5]	11,000	NA		5.3	J	5.3		9.3	J	6.9		10.4	J	26.5		60	U	5	U	9.2	J
Dissolved Aluminum	µg/L	50 [5]	36,000	14	J	***200***	U	20	U	***200***	U	20	U	***200***	U	***200***	U	NA		20	U	***200***	U
Dissolved Antimony	µg/L	6.0	15	1	U	2	U	1	U	2	U	1	U	0.11	UJ	0.38	UJ	NA		1	U	2	U
Dissolved Arsenic	µg/L	10	0.045	**0.79**	J	**1.7**		**4**		**4.9**		**4.5**		**3.5**		**12.9**		NA		***1***	U	***0.26***	UJ
Dissolved Barium	µg/L	2,000	2,600	0.55	J	12.9		25		9.7	UJ	26		35.1		39.3		NA		1	U	0.22	J
Dissolved Beryllium	µg/L	4.0	73	0.5	U	0.03	UJ	0.5	U	0.04	UJ	0.5	U	0.04	UJ	1	U	NA		0.5	U	0.03	UJ
Dissolved Boron	µg/L	--	7,300	51	J	36.7		180		39.2		130		92.1		169		NA		100	U	10.4	
Dissolved Cadmium	µg/L	5.0	18	1	U	0.04	J	1	U	0.08	J	1	U	1	U	0.71	J	NA		1	U	1	U
Dissolved Calcium	µg/L	--	--	2,900		129,000		84,000		116,000		90,000		87,900		384,999		NA		240		374	J

TABLE 4-16
Groundwater Sampling Laboratory Values for Inorganic and Field Parameters
Monitoring Wells
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ASARCO LLC Hayden, Arizona Plant Site

The data in this table are illustrated on figures 4-48, 4-49, 4-50, and 4-51.

	Location:	EPA Maximum Contaminant Level[1]	EPA Region IX Preliminary Remediation Goal[2]	MW-2				MW-4				S-4A				SM-2		Equipment Blank		Equipment Blank		Equipment Blank (ASARCO)[3]	
	Event:			Winter		Summer		Winter		Summer		Winter		Summer		Summer		Winter		Winter		Summer	
	Date:			3/2/06		8/30/06		3/2/06		8/30/06		2/28/06		8/29/06		9/1/06		2/23/06		3/3/06		8/29/06	
Parameter	Units			Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual
Dissolved Chromium	µg/L	100	--	6.4		1.7	UJ	1	U	7.1		0.88	J	0.45	J	16		NA		1	U	0.16	J
Dissolved Cobalt	µg/L	--	730	0.5	U	0.67	UJ	0.5	U	0.6	UJ	2.6		0.4	UJ	2.1		NA		0.5	U	0.46	UJ
Dissolved Copper	µg/L	1,000 [5]	1,500	2.3		2	U	4.8		2	U	2.5		2.3		2	U	NA		2	U	1.4	UJ
Dissolved Iron	µg/L	300 [5]	11,000	100	U	100	U	100	U	100	U	100	U	100	U	100	UJ	NA		100	U	100	U
Dissolved Lead	µg/L	15	--	2	U	0.05	UJ	2	U	0.04	UJ	2	U	0.1	UJ	0.1	UJ	NA		2	U	0.05	UJ
Dissolved Magnesium	µg/L	--	--	580		153,000		20,000		210,000		16,000		17,400		179,000		NA		500	U	65.9	J
Dissolved Manganese	µg/L	50 [5]	880	2	U	11.2		5		4.7		3.9		0.08	UJ	11.4		NA		2	U	1	U
Dissolved Mercury	µg/L	2.0	11	0.03	U	0.2	U	0.03	U	0.092	J	0.016	J	0.2	U	0.038	J	NA		0.03	U	0.2	U
Dissolved Molybdenum	µg/L	--	180	2.1		2.7		15		1.1		16		14.5		**394**		NA		0.3	J	0.1	
Dissolved Nickel	µg/L	--	730	1	U	5.8		20	U	4.7		10	U	3.2		7.6		NA		1	U	0.2	J
Dissolved Potassium	µg/L	--	--	5,000	U	5,790	J	6,300		5,760	J	4,200	J	4,060	J	9,040	J	NA		5,000	U	16.3	J
Dissolved Selenium	µg/L	50	180	1.1		8		0.77	J	**58.2**		2.5		2.1	UJ	**52.8**		NA		1	U	0.31	UJ
Dissolved Silver	µg/L	100 [5]	180	0.5	U	1	U	0.5	U	1	U	0.5	U	1	U	0.43	UJ	NA		0.5	U	1	U
Dissolved Sodium	µg/L	--	--	72,000		147,000		160,000		71,300		110,000		101,000		339,000		NA		1,700		354	UJ
Dissolved Thallium	µg/L	2.0	2.4	***2***	U	1	U	***2***	U	1	U	***2***	U	1	U	1	U	NA		***2***	U	1	U
Dissolved Thorium	µg/L	--	--	2	U	NA		2	U	NA		2	U			NA		NA		2	U	NA	
Dissolved Uranium	µg/L	30	7.3	6.7		NA		3.7		NA		3.8				NA		NA		0.5	U	NA	
Dissolved Vanadium	µg/L	--	36	4	U	28.8		4.1		**41.2**		4.7		6.8		11		NA		4	U	0.55	UJ
Dissolved Zinc	µg/L	5,000 [5]	11,000	5	U	3.5	J	5	U	6.2	J	13		10.4	J	9.3		NA		5	U	6.1	J
pH		<6.5 or >8.5 [5]	--	7.79		8.27		7.73		8.22		7.61		7.6		NA		NA		NA		NA	
Conductivity	mS/cm	--	--	2.4		1.97		2.37		1.9		0.92		8.44		NA		NA		NA		NA	

TABLE 4-16
Groundwater Sampling Laboratory Values for Inorganic and Field Parameters
Monitoring Wells
Remedial Investigation Report
ASARCO LLC Hayden, Arizona Plant Site

The data in this table are illustrated on figures 4-48, 4-49, 4-50, and 4-51.

	Location:	EPA Maximum Contaminant Level[1]	EPA Region IX Preliminary Remediation Goal[2]	Equipment Blank (CH2M HILL)[4]	
	Event:			Summer	
	Date:			9/1/06	
Parameter	**Units**			**Result**	**Qual**
Aluminum	µg/L	50 [5]	36,000	***200***	UJ
Antimony	µg/L	6.0	15	2	U
Arsenic	µg/L	10	0.045	***1***	U
Barium	µg/L	2,000	2,600	0.14	UJ
Beryllium	µg/L	4.0	73	1	U
Boron	µg/L	--	7,300	3.8	
Cadmium	µg/L	5.0	18	0.02	UJ
Calcium	µg/L	--	--	111	J
Chromium	µg/L	100	--	3.7	
Cobalt	µg/L	--	730	0.08	UJ
Copper	µg/L	1,000 [5]	1,500	1.3	UJ
Cyanide	µg/L	200	730	10	U
Iron	µg/L	300 [5]	11,000	19.2	J
Lead	µg/L	15	--	0.08	UJ
Magnesium	µg/L	--	--	5,000	U
Manganese	µg/L	50 [5]	880	0.49	UJ
Mercury	µg/L	2.0	11	0.2	U
Molybdenum	µg/L	--	180	0.79	
Nickel	µg/L	--	730	2.5	
Potassium	µg/L	--	--	5,000	UJ
Selenium	µg/L	50	180	5	U
Silver	µg/L	100 [5]	180	1	U
Sodium	µg/L	--	--	305	J
Thallium	µg/L	2.0	2.4	1	U
Thorium	µg/L	--	--	NA	
Uranium	µg/L	30	7.3	NA	
Vanadium	µg/L	--	36	0.13	UJ
Zinc	µg/L	5,000 [5]	11,000	3.9	
Dissolved Aluminum	µg/L	50 [5]	36,000	***200***	U
Dissolved Antimony	µg/L	6.0	15	2	U
Dissolved Arsenic	µg/L	10	0.045	***1***	U
Dissolved Barium	µg/L	2,000	2,600	0.23	J
Dissolved Beryllium	µg/L	4.0	73	1	U
Dissolved Boron	µg/L	--	7,300	1.8	
Dissolved Cadmium	µg/L	5.0	18	1	U
Dissolved Calcium	µg/L	--	--	85.9	J

TABLE 4-16
Groundwater Sampling Laboratory Values for Inorganic and Field Parameters
Monitoring Wells
Remedial Investigation Report
ASARCO LLC Hayden, Arizona Plant Site

The data in this table are illustrated on figures 4-48, 4-49, 4-50, and 4-51.

	Location:	EPA Maximum Contaminant Level[1]	EPA Region IX Preliminary Remediation Goal[2]	Equipment Blank (CH2M HILL)[4]	
	Event:			Summer	
	Date:			9/1/06	
Parameter	**Units**			**Result**	**Qual**
Dissolved Chromium	µg/L	100	--	1.4	UJ
Dissolved Cobalt	µg/L	--	730	0.02	UJ
Dissolved Copper	µg/L	1,000 [5]	1,500	1.4	UJ
Dissolved Iron	µg/L	300 [5]	11,000	100	UJ
Dissolved Lead	µg/L	15	--	0.06	UJ
Dissolved Magnesium	µg/L	--	--	5,000	U
Dissolved Manganese	µg/L	50 [5]	880	0.25	J
Dissolved Mercury	µg/L	2.0	11	0.038	J
Dissolved Molybdenum	µg/L	--	180	0.32	
Dissolved Nickel	µg/L	--	730	0.56	J
Dissolved Potassium	µg/L	--	--	5,000	UJ
Dissolved Selenium	µg/L	50	180	5	U
Dissolved Silver	µg/L	100 [5]	180	1	U
Dissolved Sodium	µg/L	--	--	432	J
Dissolved Thallium	µg/L	2.0	2.4	1	U
Dissolved Thorium	µg/L	--	--	NA	
Dissolved Uranium	µg/L	30	7.3	NA	
Dissolved Vanadium	µg/L	--	36	0.09	UJ
Dissolved Zinc	µg/L	5,000 [5]	11,000	2.7	
pH		<6.5 or >8.5 [5]	--	NA	
Conductivity	mS/cm	--	--	NA	

Table Notes:
[1] EPA Maximum Contaminant Level, EPA 816-F-03-016, June 2003
[2] EPA Region IX Preliminary Remediation Goals, Tap Water, October 2004
[3] Equipment blank taken from ASARCO sampling equipment.
[4] Equipment blank taken from CH2M HILL sampling equipment.
[5] Secondary MCL
[6] Bold values with bold outline exceed one or more of the comparison criteria.
[7] Bold italicized values have detection limits above one or more of the comparison criteria.
[8] -- = Not established
[9] J = Estimated value
[10] mS/cm = millisiemens per centimeter
[11] NA = Not analyzed
[12] U = Not detected; reporting limit is shown in place of a result.
[13] µg/L = micrograms per Liter
[14] UJ = Not detected; reporting limit is approximate and is shown in place of a result.

TABLE 4-17
Groundwater Sampling Laboratory Values for Volatile Organic Compound Parameters
Monitoring Wells
Remedial Investigation Report
ASARCO LLC Hayden, Arizona Plant Site

The data in this table are illustrated on figures 4-48 and 4-49.

	Location:	EPA Maximum Contaminant Level[1]	EPA Region IX Preliminary Remediation Goal[2]	GW-01(R)		GW-02		GW-06				H-9						H-11				MW-4				S-4A			
	Event:			Summer		Summer		Winter		Summer		Winter		Summer		Summer (Duplicate)		Winter		Summer		Winter		Summer		Winter		Summer	
	Date:			8/31/06-9/13/06		8/31/06		3/3/06		9/1/06		2/28/06		8/30/06		8/30/06		2/28/06		9/13/06		3/2/06		8/30/06		2/28/06		8/29/06	
Parameter	Units			Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual
1,1,1-Trichloroethane	µg/L	200	3,200	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U
1,1,2,2-Tetrachloroethane	µg/L	--	0.055	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U
1,1,2-Trichloroethane	µg/L	5.0	0.20	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U
1,1-Dichloroethane	µg/L	--	810	0.16	J	0.50	U	0.41	J	0.51		0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U
1,1-Dichloroethene	µg/L	7.0	340	0.81		0.50	U	0.50	U	0.55		0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U
1,2,3-Trichlorobenzene	µg/L	--	--	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	UJ	0.50	U	0.50	U	0.50	U
1,2,4-Trichlorobenzene	µg/L	70	7.2	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	UJ	0.50	U	0.50	U	0.50	U
1,2-Dibromo-3-chloropropane	µg/L	0.20	0.048	0.050	U	0.050	U	0.050	U	0.050	U	0.050	U	0.050	U	0.050	U	0.050	U	0.050	U	0.050	U	0.050	U	0.050	U	0.050	U
1,2-Dibromoethane	µg/L	0.05	0.0056	0.050	U	0.050	U	0.050	U	0.050	U	0.050	U	0.050	U	0.050	U	0.050	U	0.052		0.050	U	0.050	U	0.050	U	0.050	U
1,2-Dichlorobenzene	µg/L	600	370	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	UJ	0.50	U	0.50	U	0.50	U
1,2-Dichloroethane	µg/L	5.0	0.12	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U
1,2-Dichloropropane	µg/L	5.0	0.16	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U
1,3-Dichlorobenzene	µg/L	--	180	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	UJ	0.50	U	0.50	U	0.50	U
1,4-Dichlorobenzene	µg/L	75	0.50	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	UJ	0.50	U	0.50	U	0.50	U
1,4-Dioxane	µg/L	--	6.1	1.1	J	R		2.0	U	R		1.1	J	3.6	J	4.0	J	2.0	U	R		2.0	U	R		2.0	U	R	
2-Butanone	µg/L	--	7,000	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U
2-Hexanone	µg/L	--	--	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U
4-Methyl-2-pentanone	µg/L	--	2,000	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U
Acetone	µg/L	--	5,500	R		R		5.0	U	R		5.0	U	R		R		5.0	U	R		5.0	U	R		5.0	U	R	
Benzene	µg/L	5.0	0.35	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U
Bromochloromethane	µg/L	--	--	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U
Bromodichloromethane	µg/L	--	0.18	0.25	J	0.50	U	0.46	J	0.51		0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U
Bromoform	µg/L	--	8.5	0.50	U	0.50	U	0.50	UJ	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	UJ	0.50	U	0.50	U	0.50	U
Bromomethane	µg/L	--	8.7	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U
Carbon disulfide	µg/L	--	1,000	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U
Carbon tetrachloride	µg/L	5.0	0.17	0.50	U	0.50	U	0.50	UJ	0.12	J	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U
Chlorobenzene	µg/L	100	110	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U
Chlorodibromomethane	µg/L	--	0.13	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U
Chloroethane	µg/L	--	4.6	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U
Chloroform	µg/L	--	0.17	2.9		0.50	U	2.3	UJ	2.4		0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U
Chloromethane	µg/L	--	160	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U
cis-1,2-Dichloroethene	µg/L	70	61	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U
cis-1,3-Dichloropropene	µg/L	--	--	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U
Cyclohexane	µg/L	--	10,000	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U
Dichlorodifluoromethane	µg/L	--	390	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U
Ethylbenzene	µg/L	700	1,300	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U

TABLE 4-17
Groundwater Sampling Laboratory Values for Volatile Organic Compound Parameters
Monitoring Wells
Remedial Investigation Report
ASARCO LLC Hayden, Arizona Plant Site

The data in this table are illustrated on figures 4-48 and 4-49.

	Location:	EPA Maximum Contaminant Level[1]	EPA Region IX Preliminary Remediation Goal[2]	GW-01(R)		GW-02		GW-06				H-9						H-11				MW-4				S-4A			
	Event:			Summer		Summer		Winter		Summer		Winter		Summer		Summer (Duplicate)		Winter		Summer		Winter		Summer		Winter		Summer	
	Date:			8/31/06-9/13/06		8/31/06		3/3/06		9/1/06		2/28/06		8/30/06		8/30/06		2/28/06		9/13/06		3/2/06		8/30/06		2/28/06		8/29/06	
Parameter	Units			Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual
Isopropylbenzene	µg/L	--	660	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U
m,p-Xylene	µg/L	--	--	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U
Methyl acetate	µg/L	--	6,100	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U
Methyl tert-butyl ether	µg/L	--	11	0.23	J	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U
Methylcyclohexane	µg/L	--	5,200	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U
Methylene Chloride	µg/L	5.0	4.3	0.50	U	0.50	U	0.50	UJ	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	UJ	0.50	U	0.50	U	0.50	U
o-Xylene	µg/L	--	--	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U
Styrene	µg/L	100	1,600	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U
Tetrachloroethene	µg/L	5.0	0.10	***0.50***	U	***0.50***	U	**0.39**	J	**0.36**	J	***0.50***	U	***0.50***	U	***0.50***	U	***0.50***	U	***0.50***	U	***0.50***	U	***0.50***	U	***0.50***	U	***0.50***	U
Toluene	µg/L	1,000	720	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U
trans-1,2-Dichloroethene	µg/L	100	120	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U
trans-1,3-Dichloropropene	µg/L	--	--	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U
Trichloroethene	µg/L	5.0	0.028	***0.50***	U	***0.50***	U	***0.50***	U	**0.13**	J	***0.50***	U	***0.50***	U	***0.50***	U	***0.50***	U	***0.50***	U	***0.50***	U	***0.50***	U	***0.50***	U	***0.50***	U
Trichlorofluoromethane	µg/L	--	1,300	0.19	J	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U
Trichlorotrifluoroethane	µg/L	--	59,000	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U
Vinyl chloride	µg/L	2.0	0.02	***0.50***	U	***0.50***	U	***0.50***	U	***0.50***	U	***0.50***	U	***0.50***	U	***0.50***	U	***0.50***	U	***0.50***	U	***0.50***	U	***0.50***	U	***0.50***	U	***0.50***	U

TABLE 4-17
Groundwater Sampling Laboratory Values for Volatile Organic Compound Parameters
Monitoring Wells
Remedial Investigation Report
ASARCO LLC Hayden, Arizona Plant Site

The data in this table are illustrated on figures 4-48 and 4-49.

	Location:	EPA Maximum Contaminant Level[1]	EPA Region IX Preliminary Remediation Goal[2]	Equipment Blank		Equipment Blank (ASARCO)[3]		Equipment Blank (CH2M HILL)[4]	
	Event:			Winter		Summer		Summer	
	Date:			3/3/06		8/29/06		9/1/06	
Parameter	Units			Result	Qual	Result	Qual	Result	Qual
1,1,1-Trichloroethane	µg/L	200	3,200	0.50	U	0.50	U	0.50	U
1,1,2,2-Tetrachloroethane	µg/L	--	0.055	***0.50***	U	***0.50***	U	***0.50***	U
1,1,2-Trichloroethane	µg/L	5.0	0.20	***0.50***	U	***0.50***	U	***0.50***	U
1,1-Dichloroethane	µg/L	--	810	0.50	U	0.50	U	0.50	U
1,1-Dichloroethene	µg/L	7.0	340	0.50	U	0.50	U	0.50	U
1,2,3-Trichlorobenzene	µg/L	--	--	0.50	U	0.50	U	0.50	U
1,2,4-Trichlorobenzene	µg/L	70	7.2	0.50	U	0.50	U	0.50	U
1,2-Dibromo-3-chloropropane	µg/L	0.20	0.048	***0.050***	U	***0.050***	U	***0.050***	U
1,2-Dibromoethane	µg/L	0.05	0.0056	***0.050***	U	***0.050***	U	***0.050***	U
1,2-Dichlorobenzene	µg/L	600	370	0.50	U	0.50	U	0.50	U
1,2-Dichloroethane	µg/L	5.0	0.12	***0.50***	U	***0.50***	U	***0.50***	U
1,2-Dichloropropane	µg/L	5.0	0.16	***0.50***	U	***0.50***	U	***0.50***	U
1,3-Dichlorobenzene	µg/L	--	180	0.50	U	0.50	U	0.50	U
1,4-Dichlorobenzene	µg/L	75	0.50	***0.50***	U	***0.50***	U	***0.50***	U
1,4-Dioxane	µg/L	--	6.1	2.0	U	R		R	
2-Butanone	µg/L	--	7,000	5.0	U	5.0	U	5.0	U
2-Hexanone	µg/L	--	--	5.0	U	5.0	U	5.0	U
4-Methyl-2-pentanone	µg/L	--	2,000	5.0	U	5.0	U	5.0	U
Acetone	µg/L	--	5,500	5.7		10	J	4.6	J
Benzene	µg/L	5.0	0.35	***0.50***	U	***0.50***	U	***0.50***	U
Bromochloromethane	µg/L	--	--	0.50	U	0.50	U	0.50	U
Bromodichloromethane	µg/L	--	0.18	***0.50***	U	***0.50***	U	0.15	J
Bromoform	µg/L	--	8.5	0.50	U	0.31	J	0.50	U
Bromomethane	µg/L	--	8.7	0.50	U	0.50	U	0.50	U
Carbon disulfide	µg/L	--	1,000	0.50	U	0.50	U	0.50	U
Carbon tetrachloride	µg/L	5.0	0.17	***0.50***	U	***0.50***	U	***0.50***	U
Chlorobenzene	µg/L	100	110	0.50	U	0.50	U	0.50	U
Chlorodibromomethane	µg/L	--	0.13	***0.50***	U	***0.50***	U	**0.19**	J
Chloroethane	µg/L	--	4.6	0.50	U	0.50	U	0.50	U
Chloroform	µg/L	--	0.17	**0.70**		***0.50***	U	**0.89**	
Chloromethane	µg/L	--	160	0.50	U	0.50	U	0.50	U
cis-1,2-Dichloroethene	µg/L	70	61	0.50	U	0.50	U	0.50	U
cis-1,3-Dichloropropene	µg/L	--	--	0.50	U	0.50	U	0.50	U
Cyclohexane	µg/L	--	10,000	0.50	U	0.50	U	0.50	U
Dichlorodifluoromethane	µg/L	--	390	0.50	U	0.50	U	0.50	U
Ethylbenzene	µg/L	700	1,300	0.50	U	0.50	U	0.50	U

TABLE 4-17
Groundwater Sampling Laboratory Values for Volatile Organic Compound Parameters
Monitoring Wells
Remedial Investigation Report
ASARCO LLC Hayden, Arizona Plant Site

The data in this table are illustrated on figures 4-48 and 4-49.

	Location:	EPA Maximum Contaminant Level[1]	EPA Region IX Preliminary Remediation Goal[2]	Equipment Blank		Equipment Blank (ASARCO)[3]		Equipment Blank (CH2M HILL)[4]	
	Event:			Winter		Summer		Summer	
	Date:			3/3/06		8/29/06		9/1/06	
Parameter	**Units**			**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**
Isopropylbenzene	µg/L	--	660	0.50	U	0.50	U	0.50	U
m,p-Xylene	µg/L	--	--	0.50	U	0.50	U	0.50	U
Methyl acetate	µg/L	--	6,100	0.50	U	0.50	U	0.50	U
Methyl tert-butyl ether	µg/L	--	11	0.50	U	0.50	U	0.50	U
Methylcyclohexane	µg/L	--	5,200	0.50	U	0.50	U	0.50	U
Methylene Chloride	µg/L	5.0	4.3	0.50	U	3.3		0.50	U
o-Xylene	µg/L	--	--	0.50	U	0.50	U	0.50	U
Styrene	µg/L	100	1,600	0.50	U	0.50	U	0.50	U
Tetrachloroethene	µg/L	5.0	0.10	***0.50***	U	***0.50***	U	***0.50***	U
Toluene	µg/L	1,000	720	0.50	U	0.50	U	0.50	U
trans-1,2-Dichloroethene	µg/L	100	120	0.50	U	0.50	U	0.50	U
trans-1,3-Dichloropropene	µg/L	--	--	0.50	U	0.50	U	0.50	U
Trichloroethene	µg/L	5.0	0.028	***0.50***	U	***0.50***	U	***0.50***	U
Trichlorofluoromethane	µg/L	--	1,300	0.50	U	0.50	U	0.50	U
Trichlorotrifluoroethane	µg/L	--	59,000	0.50	U	0.50	U	0.50	U
Vinyl chloride	µg/L	2.0	0.02	***0.50***	U	***0.50***	U	***0.50***	U

Table Notes:
[1] EPA Maximum Contaminant Level, EPA 816-F-03-016, June 2003
[2] EPA Region IX Preliminary Remediation Goals, Tap Water, October 2004
[3] Bold values with bold outline exceed one or more of the comparison criteria.
[4] Bold italicized values have detection limits above one or more of the comparison criteria.
[5] -- = Not established
[6] J = Estimated value
[8] R = Rejected
[9] U = Not detected; reporting limit is shown in place of a result.
[10] µg/L = micrograms per Liter
[11] UJ = Not detected; reporting limit is approximate and is shown in place of a result.

TABLE 4-18
Groundwater Sampling Laboratory Values for Semi-Volatile Organic Compound Parameters
Monitoring Wells
Remedial Investigation Report
ASARCO LLC Hayden, Arizona Plant Site

The data in this table are illustrated on figures 4-48 and 4-49.

	Location:	EPA Maximum Contaminant Level[1]	EPA Region IX Preliminary Remediation Goal[2]	GW-01(R)		GW-02		GW-06				H-9						H-11				MW-4			
	Event:			Summer		Summer		Winter		Summer		Winter		Summer		Summer (Duplicate)		Winter		Summer		Winter		Summer	
	Date:			8/31/06		8/31/06		3/3/06		9/1/06		2/28/06		8/30/06		8/30/06		2/28/06		9/13/06		3/2/06		8/30/06	
Parameter	Units			Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual
1,1'-Biphenyl	µg/L	--	300	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U
1,2,4,5-Tetrachlorobenzene	µg/L	--	11	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U
2,2'-Oxybis(1-chloropropane)	µg/L	--	0.27	***5.0***	U	***5.0***	U	***5.0***	U	***5.0***	U	***5.0***	U	***5.0***	U	***5.0***	U	***5.0***	U	***5.0***	U	***5.0***	U	***5.0***	U
2,3,4,6-Tetrachlorophenol	µg/L	--	1,100	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U
2,4,5-Trichlorophenol	µg/L	--	3,600	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U
2,4,6-Trichlorophenol	µg/L	--	3.6	***5.0***	U	***5.0***	U	***5.0***	U	***5.0***	U	***5.0***	U	***5.0***	U	***5.0***	U	***5.0***	U	***5.0***	U	***5.0***	U	***5.0***	U
2,4-Dichlorophenol	µg/L	--	110	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U
2,4-Dimethylphenol	µg/L	--	730	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U
2,4-Dinitrophenol	µg/L	--	73	10	U	10	U	R		10	U	10	UJ	10	U	10	U	10	UJ	10	U	R		10	U
2,4-Dinitrotoluene	µg/L	--	73	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U
2,6-Dinitrotoluene	µg/L	--	36	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U
2-Chloronaphthalene	µg/L	--	490	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U
2-Chlorophenol	µg/L	--	30	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U
2-Methylnaphthalene	µg/L	--	--	0.10	U	0.10	U	0.022	UJ	0.10	U	0.023	J	0.10	U	0.10	U	0.027	J	0.10	U	0.032	J	0.10	U
2-Methylphenol	µg/L	--	1,800	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U
2-Nitroaniline	µg/L	--	110	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U
2-Nitrophenol	µg/L	--	--	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U
3,3'-Dichlorobenzidine	µg/L	--	0.15	***5.0***	U	***5.0***	U	***5.0***	U	***5.0***	U	***5.0***	U	***5.0***	U	***5.0***	U	***5.0***	U	***5.0***	U	***5.0***	U	***5.0***	U
3-Nitroaniline	µg/L	--	3.2	***10***	U	***10***	U	***10***	U	***10***	U	***10***	U	***10***	U	***10***	U	***10***	U	***10***	U	***10***	U	***10***	U
4,6-Dinitro-2-methylphenol	µg/L	--	3.6	***10***	U	***10***	U	***10***	U	***10***	U	***10***	U	***10***	U	***10***	U	***10***	U	***10***	U	***10***	U	***10***	U
4-Bromophenyl phenyl ether	µg/L	--	--	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U
4-Chloro-3-methylphenol	µg/L	--	--	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U
4-Chloroaniline	µg/L	--	150	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U
4-Chlorophenyl phenyl ether	µg/L	--	--	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U
4-Methylphenol	µg/L	--	180	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U
4-Nitroaniline	µg/L	--	3.2	***10***	U	***10***	U	***10***	U	***10***	U	***10***	U	***10***	U	***10***	U	***10***	U	***10***	U	***10***	U	***10***	U
4-Nitrophenol	µg/L	--	--	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U
Acenaphthene	µg/L	--	370	0.10	U	0.10	U	5.0	U	0.10	U	0.10	UJ	0.10	U	0.10	U	0.10	U	0.10	U	5.0	U	0.10	U
Acenaphthylene	µg/L	--	--	0.10	U	0.10	U	5.0	U	0.10	U	0.10	UJ	0.10	U	0.10	U	0.10	U	0.10	U	5.0	U	0.10	U
Acetophenone	µg/L	--	--	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U
Anthracene	µg/L	--	1,800	0.10	U	0.10	U	5.0	U	0.10	U	0.10	UJ	0.10	U	0.10	U	0.10	U	0.10	U	5.0	U	0.10	U
Atrazine	µg/L	3.0	0.30	***5.0***	U	***5.0***	U	***5.0***	U	***5.0***	U	***5.0***	U	***5.0***	U	***5.0***	U	***5.0***	U	***5.0***	U	***5.0***	U	***5.0***	U
Benzaldehyde	µg/L	--	3,600	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U
Benzo(a)anthracene	µg/L	--	0.092	***0.10***	U	***0.10***	U	***5.0***	U	***0.10***	U	***0.10***	U	***0.10***	U	***0.10***	U	***0.10***	U	***0.10***	U	***5.0***	U	***0.10***	U
Benzo(a)pyrene	µg/L	0.20	0.0092	***0.10***	U	***0.10***	U	***5.0***	U	***0.10***	U	***0.10***	U	***0.10***	U	***0.10***	U	***0.10***	U	***0.10***	U	***5.0***	U	***0.10***	U
Benzo(b)fluoranthene	µg/L	--	0.092	***0.10***	UJ	***0.10***	UJ	***5.0***	U	***0.10***	UJ	***0.10***	U	***0.10***	UJ	***0.10***	UJ	***0.10***	U	***0.10***	U	***5.0***	U	***0.10***	UJ
Benzo(g,h,i)perylene	µg/L	--	--	0.10	U	0.10	U	5.0	U	0.10	U	0.10	U	0.10	U	0.10	U	0.10	U	0.10	U	5.0	U	0.10	U
Benzo(k)fluoranthene	µg/L	--	0.92	0.10	U	0.10	U	***5.0***	U	0.10	U	0.10	U	0.10	U	0.10	U	0.10	U	0.10	U	***5.0***	U	0.10	U
Bis(2-chloroethoxy)methane	µg/L	--	--	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U
Bis(2-chloroethyl)ether	µg/L	--	0.01	***5.0***	U	***5.0***	U	***5.0***	U	***5.0***	U	***5.0***	U	***5.0***	U	***5.0***	U	***5.0***	U	***5.0***	U	***5.0***	U	***5.0***	U
bis(2-Ethylhexyl) phthalate	µg/L	6.0	4.8	***5.0***	U	***5.0***	U	0.52		***5.0***	U	***5.0***	U	***5.0***	U	***5.0***	U	0.85	J	***5.0***	U	**28**		**8.7**	

TABLE 4-18
Groundwater Sampling Laboratory Values for Semi-Volatile Organic Compound Parameters
Monitoring Wells
Remedial Investigation Report
ASARCO LLC Hayden, Arizona Plant Site

The data in this table are illustrated on figures 4-48 and 4-49.

	Location:	EPA Maximum Contaminant Level[1]	EPA Region IX Preliminary Remediation Goal[2]	GW-01(R)		GW-02		GW-06				H-9						H-11				MW-4			
	Event:			Summer		Summer		Winter		Summer		Winter		Summer		Summer (Duplicate)		Winter		Summer		Winter		Summer	
	Date:			8/31/06		8/31/06		3/3/06		9/1/06		2/28/06		8/30/06		8/30/06		2/28/06		9/13/06		3/2/06		8/30/06	
Parameter	Units			Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual
Butyl benzyl phthalate	µg/L	--	7,300	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	0.44	J	5.0	U	5.0	U
Caprolactam	µg/L	--	18,000	490		5.0	U	5.0	U	5.0	U	0.45	J	5.0	U	5.0	U	0.77	J	5.0	U	5.0	U	5.0	U
Carbazole	µg/L	--	3.4	***5.0***	U	***5.0***	U	***5.0***	U	***5.0***	U	***5.0***	U	***5.0***	U	***5.0***	U	***5.0***	U	***5.0***	U	***5.0***	U	***5.0***	U
Chrysene	µg/L	--	9.2	0.10	U	0.10	U	5.0	U	0.10	U	0.10	U	0.10	U	0.10	U	0.10	U	0.10	U	5.0	U	0.10	U
Dibenzo(a,h)anthracene	µg/L	--	0.0092	***0.10***	U	***0.10***	U	***5.0***	U	***0.10***	U	***0.10***	U	***0.10***	U	***0.10***	U	***0.10***	U	***0.10***	U	***5.0***	U	***0.10***	U
Dibenzofuran	µg/L	--	12	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U
Diethyl phthalate	µg/L	--	29,000	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	0.20	J	5.0	U	5.0	U
Dimethyl phthalate	µg/L	--	360,000	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U
Di-n-butyl phthalate	µg/L	--	3,600	5.0	U	5.0	U	0.097		5.0	U	0.24	U	5.0	U	5.0	U	0.30	U	5.0	U	0.19		5.0	U
di-n-Octyl phthalate	µg/L	--	1,500	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U
Fluoranthene	µg/L	--	1,500	0.10	U	0.10	U	5.0	U	0.10	U	0.10	U	0.10	U	0.10	U	0.10	U	0.10	U	5.0	U	0.10	U
Fluorene	µg/L	--	240	0.10	U	0.10	U	5.0	U	0.10	U	0.10	UJ	0.10	U	0.10	U	0.10	U	0.10	U	5.0	U	0.10	U
Hexachlorobenzene	µg/L	1.0	0.042	***5.0***	U	***5.0***	U	***5.0***	U	***5.0***	U	***5.0***	U	***5.0***	U	***5.0***	U	***5.0***	U	***5.0***	U	***5.0***	U	***5.0***	U
Hexachlorobutadiene	µg/L	--	0.86	***5.0***	U	***5.0***	U	***5.0***	U	***5.0***	U	***5.0***	U	***5.0***	U	***5.0***	U	***5.0***	U	***5.0***	U	***5.0***	U	***5.0***	U
Hexachlorocyclopentadiene	µg/L	50	220	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U
Hexachloroethane	µg/L	--	4.8	***5.0***	U	***5.0***	U	***5.0***	U	***5.0***	U	***5.0***	U	***5.0***	U	***5.0***	U	***5.0***	U	***5.0***	U	***5.0***	U	***5.0***	U
Indeno(1,2,3-cd)pyrene	µg/L	--	0.092	***0.10***	U	***0.10***	U	***5.0***	U	***0.10***	U	***0.10***	U	***0.10***	U	***0.10***	U	***0.10***	U	***0.10***	U	***5.0***	U	***0.10***	U
Isophorone	µg/L	--	71	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	0.44	J	5.0	U	5.0	U	5.0	U
Naphthalene	µg/L	--	6.2	0.10	U	0.10	U	5.0	U	0.10	U	0.10	UJ	0.10	U	0.10	U	0.10	U	0.10	U	0.071	J	0.10	U
Nitrobenzene	µg/L	--	3.4	***5.0***	U	***5.0***	U	***5.0***	U	***5.0***	U	***5.0***	U	***5.0***	U	***5.0***	U	***5.0***	U	***5.0***	U	***5.0***	U	***5.0***	U
n-Nitroso-di-n-propylamine	µg/L	--	0.0096	***5.0***	U	***5.0***	U	***5.0***	U	***5.0***	U	***5.0***	U	***5.0***	U	***5.0***	U	***5.0***	U	***5.0***	U	***5.0***	U	***5.0***	U
n-Nitrosodiphenylamine	µg/L	--	14	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U
Pentachlorophenol	µg/L	1.0	0.56	***10***	U	***10***	U	***10***	U	***10***	U	0.20	UJ	***10***	U	***10***	U	0.20	UJ	0.20	U	***10***	U	***10***	U
Phenanthrene	µg/L	--	--	0.10	U	0.10	U	5.0	U	0.10	U	0.10	UJ	0.10	U	0.10	U	0.10	U	0.10	U	5.0	U	0.10	U
Phenol	µg/L	--	11,000	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U
Pyrene	µg/L	--	180	0.10	UJ	0.10	UJ	5.0	U	0.10	UJ	0.10	U	0.10	UJ	0.10	UJ	0.10	U	0.10	U	5.0	U	0.10	UJ

TABLE 4-18
Groundwater Sampling Laboratory Values for Semi-Volatile Organic Compound Parameters
Monitoring Wells
Remedial Investigation Report
ASARCO LLC Hayden, Arizona Plant Site

The data in this table are illustrated on figures 4-48 and 4-49.

	Location:	EPA Maximum Contaminant Level[1]	EPA Region IX Preliminary Remediation Goal[2]	S-4A				Equipment Blank		Equipment Blank (ASARCO)[1]		Equipment Blank (CH2M HILL)[2]	
	Event:			Winter		Summer		Winter		Summer		Summer	
	Date:			2/28/06		8/29/06		3/3/06		8/29/06		9/1/06	
Parameter	Units			Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual
1,1'-Biphenyl	µg/L	--	300	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U
1,2,4,5-Tetrachlorobenzene	µg/L	--	11	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U
2,2'-Oxybis(1-chloropropane)	µg/L	--	0.27	***5.0***	U	***5.0***	U	***5.0***	U	***5.0***	U	***5.0***	U
2,3,4,6-Tetrachlorophenol	µg/L	--	1,100	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U
2,4,5-Trichlorophenol	µg/L	--	3,600	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U
2,4,6-Trichlorophenol	µg/L	--	3.6	***5.0***	U	***5.0***	U	***5.0***	U	***5.0***	U	***5.0***	U
2,4-Dichlorophenol	µg/L	--	110	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U
2,4-Dimethylphenol	µg/L	--	730	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U
2,4-Dinitrophenol	µg/L	--	73	10	UJ	10	U	R		10	U	10	U
2,4-Dinitrotoluene	µg/L	--	73	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U
2,6-Dinitrotoluene	µg/L	--	36	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U
2-Chloronaphthalene	µg/L	--	490	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U
2-Chlorophenol	µg/L	--	30	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U
2-Methylnaphthalene	µg/L	--	--	0.018	J	0.10	U	0.022	J	5.0	J	0.10	U
2-Methylphenol	µg/L	--	1,800	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U
2-Nitroaniline	µg/L	--	110	10	U	10	U	10	U	10	U	10	U
2-Nitrophenol	µg/L	--	--	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U
3,3'-Dichlorobenzidine	µg/L	--	0.15	***5.0***	U	***5.0***	U	***5.0***	U	***5.0***	U	***5.0***	U
3-Nitroaniline	µg/L	--	3.2	***10***	U	***10***	U	***10***	U	***10***	U	***10***	U
4,6-Dinitro-2-methylphenol	µg/L	--	3.6	***10***	U	***10***	U	***10***	U	***10***	U	***10***	U
4-Bromophenyl phenyl ether	µg/L	--	--	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U
4-Chloro-3-methylphenol	µg/L	--	--	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U
4-Chloroaniline	µg/L	--	150	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U
4-Chlorophenyl phenyl ether	µg/L	--	--	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U
4-Methylphenol	µg/L	--	180	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U
4-Nitroaniline	µg/L	--	3.2	***10***	U	***10***	U	***10***	U	***10***	U	***10***	U
4-Nitrophenol	µg/L	--	--	10	U	10	U	10	U	10	U	10	U
Acenaphthene	µg/L	--	370	0.10	U	0.10	U	5.0	U	0.10	U	0.10	U
Acenaphthylene	µg/L	--	--	0.10	U	0.10	U	5.0	U	0.10	U	0.10	U
Acetophenone	µg/L	--	--	5.0	U	5.0	U	5.0	U	5.3	J	5.0	U
Anthracene	µg/L	--	1,800	0.10	U	0.10	U	5.0	U	0.10	U	0.10	U
Atrazine	µg/L	3.0	0.30	***5.0***	U	***5.0***	U	***5.0***	U	***5.0***	U	***5.0***	U
Benzaldehyde	µg/L	--	3,600	5.0	U	5.0	U	5.0	U	0.82	J	5.0	U
Benzo(a)anthracene	µg/L	--	0.092	***0.10***	U	***0.10***	U	***5.0***	U	***0.10***	U	***0.10***	U
Benzo(a)pyrene	µg/L	0.20	0.0092	***0.10***	U	***0.10***	U	***5.0***	U	***0.10***	U	***0.10***	U
Benzo(b)fluoranthene	µg/L	--	0.092	***0.10***	U	***0.10***	UJ	***5.0***	U	***0.10***	UJ	***0.10***	UJ
Benzo(g,h,i)perylene	µg/L	--	--	0.10	U	0.10	U	5.0	U	0.10	U	0.10	U
Benzo(k)fluoranthene	µg/L	--	0.92	0.10	U	0.10	U	***5.0***	U	0.10	U	0.10	U
Bis(2-chloroethoxy)methane	µg/L	--	--	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U
Bis(2-chloroethyl)ether	µg/L	--	0.01	***5.0***	U	***5.0***	U	***5.0***	U	***5.0***	U	***5.0***	U
bis(2-Ethylhexyl) phthalate	µg/L	6.0	4.8	0.26	J	***5.0***	U	***5.0***	U	***5.0***	U	***5.0***	U

TABLE 4-18
Groundwater Sampling Laboratory Values for Semi-Volatile Organic Compound Parameters
Monitoring Wells
Remedial Investigation Report
ASARCO LLC Hayden, Arizona Plant Site

The data in this table are illustrated on figures 4-48 and 4-49.

	Location:	EPA Maximum Contaminant Level[1]	EPA Region IX Preliminary Remediation Goal[2]	S-4A				Equipment Blank		Equipment Blank (ASARCO)[1]		Equipment Blank (CH2M HILL)[2]	
	Event:			Winter		Summer		Winter		Summer		Summer	
	Date:			2/28/06		8/29/06		3/3/06		8/29/06		9/1/06	
Parameter	Units			Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual
Butyl benzyl phthalate	µg/L	--	7,300	5.0	U	5.0	U	5.0	U	0.58	J	5.0	U
Caprolactam	µg/L	--	18,000	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U
Carbazole	µg/L	--	3.4	***5.0***	U	***5.0***	U	***5.0***	U	***5.0***	U	***5.0***	U
Chrysene	µg/L	--	9.2	0.10	U	0.10	U	5.0	U	0.10	U	0.10	U
Dibenzo(a,h)anthracene	µg/L	--	0.0092	***0.10***	U	***0.10***	U	***5.0***	U	***0.10***	U	***0.10***	U
Dibenzofuran	µg/L	--	12	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U
Diethyl phthalate	µg/L	--	29,000	5.0	U	5.0	U	5.0	U	2.0	J	5.0	U
Dimethyl phthalate	µg/L	--	360,000	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U
Di-n-butyl phthalate	µg/L	--	3,600	0.13	U	5.0	U	0.15		1.0	J	5.0	U
di-n-Octyl phthalate	µg/L	--	1,500	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U
Fluoranthene	µg/L	--	1,500	0.10	U	0.10	U	5.0	U	0.10	U	0.10	U
Fluorene	µg/L	--	240	0.10	U	0.10	U	5.0	U	1.3	J	0.10	U
Hexachlorobenzene	µg/L	1.0	0.042	***5.0***	U	***5.0***	U	***5.0***	U	***5.0***	U	***5.0***	U
Hexachlorobutadiene	µg/L	--	0.86	***5.0***	U	***5.0***	U	***5.0***	U	***5.0***	U	***5.0***	U
Hexachlorocyclopentadiene	µg/L	50	220	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U
Hexachloroethane	µg/L	--	4.8	***5.0***	U	***5.0***	U	***5.0***	U	***5.0***	U	***5.0***	U
Indeno(1,2,3-cd)pyrene	µg/L	--	0.092	***0.10***	U	***0.10***	U	***5.0***	U	***0.10***	U	***0.10***	U
Isophorone	µg/L	--	71	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U
Naphthalene	µg/L	--	6.2	0.10	U	0.10	U	5.0	U	6.8	J	0.10	U
Nitrobenzene	µg/L	--	3.4	***5.0***	U	***5.0***	U	***5.0***	U	***5.0***	U	***5.0***	U
n-Nitroso-di-n-propylamine	µg/L	--	0.0096	***5.0***	U	***5.0***	U	***5.0***	U	***5.0***	U	***5.0***	U
n-Nitrosodiphenylamine	µg/L	--	14	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U
Pentachlorophenol	µg/L	1.0	0.56	0.20	UJ	***10***	U	***10***	U	***10***	U	***10***	U
Phenanthrene	µg/L	--	--	0.10	U	0.10	U	5.0	U	2.7	J	0.10	U
Phenol	µg/L	--	11,000	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U
Pyrene	µg/L	--	180	0.10	U	0.10	UJ	5.0	U	0.10	UJ	0.10	UJ

Table Notes:

[1] EPA Maximum Contaminant Level, EPA 816-F-03-016, June 2003
[2] EPA Region IX Preliminary Remediation Goals, Tap Water, October 2004
[3] Bold values with bold outline exceed one or more of the comparison criteria.
[4] Bold italicized values have detection limits above one or more of the comparison criteria.
[5] -- = Not established
[6] J = Estimated value
[7] R = Rejected
[8] U = Not detected; reporting limit is shown in place of a result.
[9] µg/L = micrograms per Liter
[10] UJ = Not detected; reporting limit is approximate and is shown in place of a result.

TABLE 4-19
Groundwater Sampling Laboratory Values for Total Petroleum Hydrocarbon Parameters
Monitoring Wells
Remedial Investigation Report
ASARCO LLC Hayden, Arizona Plant Site

	Location:	EPA Maximum Contaminant Level[1]	EPA Region IX Preliminary Remediation Goal[2]	GW-01(R)				GW-02		GW-06				Equipment Blank		Equipment Blank (ASARCO)[3]		Equipment Blank (CH2M HILL)[4]	
	Event:			Summer		Summer		Summer		Winter		Summer		Winter		Summer		Summer	
	Date:			8/31/06		9/13/06		8/31/06		3/3/06		9/1/06		3/3/06		8/29/06		9/1/06	
Parameter	Units			Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual
TPH as Gasoline	µg/L	--	--	50	U	NA		50	U	50	U	33	J	50	U	50	U	50	U
TPH as Motor Oil	µg/L	--	--	NA		1,000	U	950	U	1,000	U	950	U	1,000	U	1,000	U	1,000	U
TPH as Diesel	µg/L	--	--	NA		330		240	U	250	U	240	U	250	U	250	U	250	U

Table Notes:

[1] EPA Maximum Contaminant Level, EPA 816-F-03-016, June 2003

[2] EPA Region IX Preliminary Remediation Goals, Residential Soil, October 2004

[3] Equipment blank taken from ASARCO sampling equipment.

[4] Equipment blank taken from CH2M HILL sampling equipment.

[5] -- = Not established

[6] J = Estimated value

[7] NA = Not analyzed

[8] U = Not detected; reporting limit is shown in place of a result.

[9] µg/L = micrograms per Liter

TABLE 4-20
Groundwater Sampling Laboratory Values for General Water Quality Parameters
Monitoring Wells
Remedial Investigation Report
ASARCO LLC Hayden, Arizona Plant Site

The data in this table are illustrated on figures 4-48, 4-49, 4-50, and 4-51.

	Location:	EPA Maximum Contaminant Level[1]	EPA Region IX Preliminary Remediation Goal[2]	GW-01(R)		GW-02		GW-03								GW-06				ARU-1				ARU-8			
	Event:			Summer		Summer		Winter		Winter (Duplicate)		Summer		Summer (Duplicate)		Winter		Summer		Winter		Summer		Winter		Summer	
	Date:			8/31/06		8/31/06		3/3/06		3/3/06		9/1/06		9/1/06		3/3/06		9/1/06		3/2/06		8/29/06		3/2/06		8/29/06	
Parameter	Units			Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual
Bicarbonate Alkalinity	mg/L	--	--	200		140		230		230		210		220		230		140		130		140		270		340	
Carbonate Alkalinity	mg/L	--	--	10	U	10	U	10	U	10	U	10	U	10	U	210		10	U	28		16		10	U	10	U
Chloride	mg/L	250 [5]	--	**410**		89		94		92		130		130		**290**		**280**		16		15		84		85	
Fluoride	mg/L	4.0	2.2	0.4		**5.6**		2.1		2.1		1.7		1.7		0.13		0.24		0.42		0.39		**3.3**		**3.2**	
Hardness, as CaCO3	mg/L	--	--	NA		NA		240		220		NA		NA		970		NA		17		NA		290		NA	
Dissolved Hardness, as CaCO3	mg/L	--	--	NA		NA		230		230		NA		NA		980		NA		900		NA		290		NA	
Hydroxide Alkalinity	mg/L	--	--	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U
Sulfate	mg/L	250 [5]	--	**900**		**830**		190		190		240		240		**630**		**640**		14		13		**360**		**370**	
Total Alkalinity	mg/L	--	--	200		140		230		230		210		220		440		140		150		150		270		340	
Total Dissolved Solids	mg/L	500 [5]	--	**2,300**		**1,500**		**680**		**660**		**830**		**830**		**1,500**		**1,500**		230		210		**960**		**980**	

TABLE 4-20
Groundwater Sampling Laboratory Values for General Water Quality Parameters
Monitoring Wells
Remedial Investigation Report
ASARCO LLC Hayden, Arizona Plant Site

The data in this table are illustrated on figures 4-48, 4-49, 4-50, and 4-51.

	Location:	EPA Maximum Contaminant Level[1]	EPA Region IX Preliminary Remediation Goal[2]	H-1				H-2A				H-3				H-4				H-5				H-6				H-7	
	Event:			Winter		Summer		Winter		Summer		Winter		Summer		Winter		Summer		Winter		Summer		Winter		Summer		Summer	
	Date:			2/28/06		9/13/06		2/28/06		9/13/06		2/28/06		8/29/06		2/28/06		8/29/06		2/28/06		9/13/06		2/27/06		8/29/06		8/30/06	
Parameter	**Units**			**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**
Bicarbonate Alkalinity	mg/L	--	--	290		280		310		280		470		370		330		230		240		170		200		100		240	
Carbonate Alkalinity	mg/L	--	--	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	72	
Chloride	mg/L	250 [5]	--	**270**		**510**		230		200		**450**		**390**		220		**260**		190		**400**		160		170		25	
Fluoride	mg/L	4.0	2.2	0.99		0.8		1.2		0.93		**5.6**		**6.1**		**2.5**		**2.7**		1.4		0.91		1.2		1.4		0.66	
Hardness, as CaCO3	mg/L	--	--	1,500		NA		1,300		NA		880		NA		330		NA		220		NA		220		NA		NA	
Dissolved Hardness, as CaCO3	mg/L	--	--	1,600		NA		1,300		NA		870		NA		320		NA		220		NA		220		NA		NA	
Hydroxide Alkalinity	mg/L	--	--	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U
Sulfate	mg/L	250 [5]	--	**1,600**		**2,000**		**1,300**		**1,200**		**1,100**		**920**		230		210		110		**500**		100		160		43	
Total Alkalinity	mg/L	--	--	290		280		310		280		470		370		330		230		240		170		200		100		310	
Total Dissolved Solids	mg/L	500 [5]	--	**3,000**		**4,100**		**2,400**		**2,400**		**2,200**		**2,500**		**1,000**		**1,000**		**730**		**1,700**		**600**		**740**		**600**	

TABLE 4-20
Groundwater Sampling Laboratory Values for General Water Quality Parameters
Monitoring Wells
Remedial Investigation Report
ASARCO LLC Hayden, Arizona Plant Site

The data in this table are illustrated on figures 4-48, 4-49, 4-50, and 4-51.

	Location:	EPA Maximum Contaminant Level[1]	EPA Region IX Preliminary Remediation Goal[2]	H-8				H-9								H-10				H-11				LC-1			
	Event:			Winter		Summer		Winter		Winter (Duplicate)		Summer		Summer (Duplicate)		Winter		Summer		Winter		Summer		Winter		Summer	
	Date:			2/28/06		8/30/06		2/28/06		2/28/06		8/30/06		8/30/06		2/27/06		8/29/06		2/28/06		9/13/06		2/28/06		8/30/06	
Parameter	**Units**			**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**
Bicarbonate Alkalinity	mg/L	--	--	300		200		330		330		290		280		260		190		240		260		130		110	
Carbonate Alkalinity	mg/L	--	--	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U
Chloride	mg/L	250 [5]	--	**280**		40		**500**		**510**		**510**		**490**		**280**		220		**310**		**290**		54		72	
Fluoride	mg/L	4.0	2.2	0.38		0.91		0.69		0.66		0.61		0.63		0.76		0.76		1.4		1.4		0.45		0.41	
Hardness, as CaCO3	mg/L	--	--	1,000		NA		NA		1,900		NA		NA		420		NA		690		NA		730		NA	
Dissolved Hardness, as CaCO3	mg/L	--	--	1,000		NA		1,900		NA		NA		NA		420		NA		690		NA		700		NA	
Hydroxide Alkalinity	mg/L	--	--	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U
Sulfate	mg/L	250 [5]	--	**1,100**		**630**		**1,700**		**1,700**		**1,800**		**1,800**		230		200		**620**		**530**		**1,400**		**1,300**	
Total Alkalinity	mg/L	--	--	300		200		330		330		290		280		260		190		240		260		130		110	
Total Dissolved Solids	mg/L	500 [5]	--	**2,400**		**1,200**		**3,600**		**3,700**		**3,700**		**3,800**		**1,100**		**930**		**1,700**		**1,600**		**2,500**		**2,600**	

TABLE 4-20
Groundwater Sampling Laboratory Values for General Water Quality Parameters
Monitoring Wells
Remedial Investigation Report
ASARCO LLC Hayden, Arizona Plant Site

The data in this table are illustrated on figures 4-48, 4-49, 4-50, and 4-51.

	Location:	EPA Maximum Contaminant Level[1]	EPA Region IX Preliminary Remediation Goal[2]	MW-2				MW-4				S-4A				SM-2		Equipment Blank		Equipment Blank (ASARCO)[3]		Equipment Blank (CH2M HILL)[4]	
	Event:			Winter		Summer		Winter		Summer		Winter		Summer		Summer		Winter		Summer		Summer	
	Date:			3/2/06		8/30/06		3/2/06		8/30/06		2/28/06		8/29/06		9/1/06		3/3/06		8/29/06		9/1/06	
Parameter	Units			Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual
Bicarbonate Alkalinity	mg/L	--	--	NA		77		NA		120		NA		210		180		10	U	9	J	10	U
Carbonate Alkalinity	mg/L	--	--	NA		10	U	NA		10	U	NA		10	U	10	U	10	U	10	U	10	U
Chloride	mg/L	250 [5]	--	NA		**340**		NA		180		NA		30		**590**		2.7		1	U	1	U
Fluoride	mg/L	4.0	2.2	NA		0.23		NA		0.2		NA		1.8		0.15	J	0.1	U	0.1	U	0.1	U
Hardness, as CaCO3	mg/L	--	--	NA		NA		1,200		NA		290		NA		NA		2.3	U	NA		NA	
Dissolved Hardness, as CaCO3	mg/L	--	--	9.6		NA		290		NA		290		NA		NA		2.3	U	NA		NA	
Hydroxide Alkalinity	mg/L	--	--	NA		10	U	NA		10	U	NA		10	U	10	U	10	U	10	U	10	U
Sulfate	mg/L	250 [5]	--	NA		**710**		NA		**900**		NA		220		**1,200**		0.5	U	0.5	U	0.5	U
Total Alkalinity	mg/L	--	--	NA		77		NA		120		NA		210		180		10	U	9	J	10	U
Total Dissolved Solids	mg/L	500 [5]	--	NA		**1,700**		NA		**1,700**		NA		**650**		**3,000**		20	U	20	U	12	J

Table Notes:

[1] EPA Maximum Contaminant Level, EPA 816-F-03-016, June 2003
[2] EPA Region IX Preliminary Remediation Goals, Tap Water, October 2004
[3] Equipment blank taken from ASARCO sampling equipment.
[4] Equipment blank taken from CH2M HILL sampling equipment.
[5] Secondary MCL
[6] Bold values with bold outline exceed one or more of the comparison criteria.
[7] -- = Not established
[8] J = Estimated value
[9] mg/L = milligrams per Liter
[10] NA = Not analyzed
[11] U = Not detected; reporting limit is shown in place of a result.

TABLE 4-21
Groundwater Sampling Laboratory Values for Radionuclide Parameters
Monitoring Wells
Remedial Investigation Report
ASARCO LLC Hayden, Arizona Plant Site

The data in this table are illustrated on figures 4-48 and 4-49.

	Location:	EPA Maximum Contaminant Level[1]	EPA Region IX Preliminary Remediation Goal[2]	GW-01(R)				GW-02		GW-03								GW-06				ARU-1			
	Event:			Summer		Summer		Summer		Winter		Winter (Duplicate)		Summer		Summer (Duplicate)		Winter		Summer		Winter		Summer	
	Date:			8/31/06		9/13/06		8/31/06		3/3/06		3/3/06		9/1/06		9/1/06		3/3/06		9/1/06		3/2/06		8/29/06	
Parameter	Units			Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual
Gross Alpha Activity	pCi/L	15	--	6.6		5.1		2.2		3.5		3.7		5.1		6.6		2.4		2.2		7.1		5	
Adjusted Gross Alpha	pCi/L	--	--	NA		NA		NA		1	U	0.5		NA		NA		0.9		NA		0.7		NA	
Gross Beta Activity	pCi/L	--	--	8.7		9.6	U	28.2		4.8		3.4	U	3.5	U	5.7		7.2	U	4.9	U	5.6		3	U
Radium 226 Activity	pCi/L	--	0.000823	**0.4**		***0.4***	U	***0.5***	U	***0.4***	U	***0.3***	U	***0.5***	U	**0.3**		***0.4***	U	***0.4***	U	***0.3***	U	***0.2***	U
Radium 228 Activity	pCi/L	--	0.0458	***0.4***	U	***0.4***	U	***0.4***	U	***0.4***	U	***0.3***	U	***0.4***	U	***0.4***	U	***0.4***	U	***0.4***	U	***0.3***	U	***0.3***	U
Combined Radium	pCi/L	5.0	--	0.4		0.4	U	0.5	U	0.4	U	0.3	U	0.5	U	0.3		0.4	U	0.4	U	0.3	U	0.3	U
Uranium 234 Activity	pCi/L	--	0.674	NA		NA		NA		**2.4**		**2.4**		NA		NA		**0.9**		NA		**3.3**		NA	
Uranium 234 Content	µCi/L	--	--	NA		NA		NA		0.0004		0.0004		NA		NA		0.0002		NA		0.0005		NA	
Uranium 235 Activity	pCi/L	--	0.684	NA		NA		NA		0.086		0.035		NA		NA		0.028		NA		0.138		NA	
Uranium 235 Content	µCi/L	--	--	NA		NA		NA		0.04		0.016		NA		NA		0.013		NA		0.065		NA	
Uranium 238 Activity	pCi/L	--	0.744	NA		NA		NA		**1.8**		**0.8**		NA		NA		0.6		NA		**3**		NA	
Uranium 238 Content	µCi/L	--	--	NA		NA		NA		5.5		2.3		NA		NA		1.8		NA		8.8		NA	
Total Uranium Activity	pCi/L	--	--	NA		NA		NA		4.3		3.2		NA		NA		1.5		NA		6.4		NA	
Isotopic Uranium Content	µCi/L	--	--	NA		NA		NA		5.5		2.3		NA		NA		1.8		NA		8.9		NA	

TABLE 4-21
Groundwater Sampling Laboratory Values for Radionuclide Parameters
Monitoring Wells
Remedial Investigation Report
ASARCO LLC Hayden, Arizona Plant Site

The data in this table are illustrated on figures 4-48 and 4-49.

	Location:	EPA Maximum Contaminant Level[1]	EPA Region IX Preliminary Remediation Goal[2]	ARU-8				H-1				H-2A				H-3				H-4				H-5			
	Event:			Winter		Summer		Winter		Summer		Winter		Summer		Winter		Summer		Winter		Summer		Winter		Summer	
	Date:			3/2/06		8/29/06		2/28/06		9/13/06		2/28/06		9/13/06		2/28/06		8/29/06		2/28/06		8/29/06		2/28/06		9/13/06	
Parameter	**Units**			**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**
Gross Alpha Activity	pCi/L	15	--	5.4		7.8		2.2		3.5		1.7		4		**21.7**		**16.3**		8.8		6.2		2.1		6.7	
Adjusted Gross Alpha	pCi/L	--	--	0.1		NA		0.2		NA		1	U	NA		2.3		NA		0.9		NA		1		NA	
Gross Beta Activity	pCi/L	--	--	9.8		6.5		7.8	U	7.9		8.1	U	7.9		15		9.4	U	11		6.6	U	7.2		6.9	
Radium 226 Activity	pCi/L	--	0.000823	***0.3***	U	***0.2***	U	***0.4***	U	***0.5***	U	***0.4***	U	***0.5***	U	***0.4***	U	***0.3***	U	***0.3***	U	***0.3***	U	***0.3***	U	***0.6***	U
Radium 228 Activity	pCi/L	--	0.0458	***0.3***	U	***0.3***	U	***0.4***	U	***0.4***	U	***0.4***	U	***0.4***	U	***0.4***	U	***0.3***	U	***0.4***	U	***0.4***	U	***0.3***	U	***0.3***	U
Combined Radium	pCi/L	5.0	--	0.3	U	0.3	U	0.4	U	0.5	U	0.4	U	0.5	U	0.4	U	0.3	U	0.4	U	0.4	U	0.3	U	0.6	U
Uranium 234 Activity	pCi/L	--	0.674	**2.8**		NA		**1.1**		NA		**1.4**		NA		**13.9**		NA		**4.8**		NA		0.6		NA	
Uranium 234 Content	µCi/L	--	--	0.0004		NA		0.0002		NA		0.0002		NA		0.0022		NA		0.0008		NA		0.0001		NA	
Uranium 235 Activity	pCi/L	--	0.684	0.111		NA		0.038		NA		0.04		NA		0.247		NA		0.136		NA		0.023		NA	
Uranium 235 Content	µCi/L	--	--	0.052		NA		0.018		NA		0.019		NA		0.115		NA		0.063		NA		0.011		NA	
Uranium 238 Activity	pCi/L	--	0.744	**2.4**		NA		**0.8**		NA		**0.9**		NA		**5.3**		NA		**2.9**		NA		0.5		NA	
Uranium 238 Content	µCi/L	--	--	7.1		NA		2.4		NA		2.6		NA		15.8		NA		8.7		NA		1.4		NA	
Total Uranium Activity	pCi/L	--	--	5.3		NA		2		NA		2.3		NA		19.4		NA		7.9		NA		1.1		NA	
Isotopic Uranium Content	µCi/L	--	--	7.1		NA		2.4		NA		2.6		NA		15.9		NA		8.7		NA		1.5		NA	

TABLE 4-21
Groundwater Sampling Laboratory Values for Radionuclide Parameters
Monitoring Wells
Remedial Investigation Report
ASARCO LLC Hayden, Arizona Plant Site

The data in this table are illustrated on figures 4-48 and 4-49.

	Location:	EPA Maximum Contaminant Level[1]	EPA Region IX Preliminary Remediation Goal[2]	H-6				H-7		H-8				H-9								H-10			
	Event:			Winter		Summer		Summer		Winter		Summer		Winter		Winter (Duplicate)		Summer		Summer (Duplicate)		Winter		Summer	
	Date:			2/27/06		8/29/06		8/30/06		2/28/06		8/30/06		2/28/06		2/28/06		8/30/06		8/30/06		2/27/06		8/29/06	
Parameter	Units			Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual
Gross Alpha Activity	pCi/L	15	--	3.4		2.6		**16.4**		5		3.9		9.4		8.8		9.8		11.2		2.8		3.5	
Adjusted Gross Alpha	pCi/L	--	--	0.2		NA		NA		1		NA		0.1		1	U	NA		NA		0.4		NA	
Gross Beta Activity	pCi/L	--	--	3.4	U	4.6		3.3	U	13.2		5.7		13.4		9.6	U	7.1	U	3	U	7		4.4	
Radium 226 Activity	pCi/L	--	0.000823	**0.8**		***0.3***	U	***0.3***	U	***0.4***	U	***0.3***	U	***0.4***	U	***0.3***	U	***0.3***	U	***0.3***	U	***0.4***	U	***0.3***	U
Radium 228 Activity	pCi/L	--	0.0458	***0.3***	U	***0.3***	U	***0.4***	U	***0.4***	U	***0.3***	U	***0.4***	U	***0.3***	U	***0.4***	U	***0.3***	U	***0.4***	U	***0.4***	U
Combined Radium	pCi/L	5.0	--	0.8		0.3	U	0.4	U	0.4	U	0.3	U	0.4	U	0.3	U	0.4	U	0.3	U	0.4	U	0.4	U
Uranium 234 Activity	pCi/L	--	0.674	**2.1**		NA		NA		**2.6**		NA		**5.5**		**6.3**		NA		NA		**1.8**		NA	
Uranium 234 Content	µCi/L	--	--	0.0003		NA		NA		0.0004		NA		0.0009		0.001		NA		NA		0.0003		NA	
Uranium 235 Activity	pCi/L	--	0.684	0.048		NA		NA		0.06		NA		0.169		0.123		NA		NA		0.028		NA	
Uranium 235 Content	µCi/L	--	--	0.022		NA		NA		0.028		NA		0.079		0.058		NA		NA		0.013		NA	
Uranium 238 Activity	pCi/L	--	0.744	**1**		NA		NA		**1.3**		NA		**3.6**		**2.6**		NA		NA		0.6		NA	
Uranium 238 Content	µCi/L	--	--	3.1		NA		NA		3.9		NA		10.8		7.9		NA		NA		1.8		NA	
Total Uranium Activity	pCi/L	--	--	3.2		NA		NA		4		NA		9.3		9		NA		NA		2.4		NA	
Isotopic Uranium Content	µCi/L	--	--	3.1		NA		NA		3.9		NA		10.9		7.9		NA		NA		1.8		NA	

TABLE 4-21
Groundwater Sampling Laboratory Values for Radionuclide Parameters
Monitoring Wells
Remedial Investigation Report
ASARCO LLC Hayden, Arizona Plant Site

The data in this table are illustrated on figures 4-48 and 4-49.

	Location:	EPA Maximum Contaminant Level[1]	EPA Region IX Preliminary Remediation Goal[2]	H-11				LC-1				MW-2				MW-4				S-4A				SM-2	
	Event:			Winter		Summer		Winter		Summer		Winter		Summer		Winter		Summer		Winter		Summer		Summer	
	Date:			2/28/06		9/13/06		2/28/06		8/30/06		3/2/06		8/30/06		3/2/06		8/30/06		2/28/06		8/29/06		9/1/06	
Parameter	**Units**			**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**
Gross Alpha Activity	pCi/L	15	--	4.2		4.5		5.9		4		2.5		1.5		1.7		2		4		3.9		**21.3**	
Adjusted Gross Alpha	pCi/L	--	--	1	U	NA		4.8		NA		2.5		NA		0.4		NA		1	U	NA		NA	
Gross Beta Activity	pCi/L	--	--	7.7		4.2	U	7.8	U	5	U	4.3	U	4.2	U	6.4		5.9		3.4	U	3.4	U	9.8	U
Radium 226 Activity	pCi/L	--	0.000823	***0.3***	U	***0.5***	U	***0.4***	U	***0.3***	U	***0.3***	U	***0.3***	U	***0.5***	U	***0.2***	U	***0.5***	U	***0.2***	U	***0.7***	U
Radium 228 Activity	pCi/L	--	0.0458	***0.4***	U	***0.4***	U	***0.4***	U	***0.4***	U	***0.3***	U	***0.4***	U	***0.4***	U	***0.4***	U	***0.4***	U	***0.3***	U	***0.4***	U
Combined Radium	pCi/L	5.0	--	0.4	U	0.5	U	0.4	U	0.4	U	0.3	U	0.4	U	0.5	U	0.4	U	0.5	U	0.3	U	0.7	U
Uranium 234 Activity	pCi/L	--	0.674	**2.7**		NA		0.6		NA		0.3	U	NA		**0.8**		NA		**2.7**		NA		NA	
Uranium 234 Content	µCi/L	--	--	0.0004		NA		0.0001		NA		0.0001	U	NA		0.0001		NA		0.0004		NA		NA	
Uranium 235 Activity	pCi/L	--	0.684	0.068		NA		0.023		NA		0.021	U	NA		0.023		NA		0.065		NA		NA	
Uranium 235 Content	µCi/L	--	--	0.032		NA		0.011		NA		0.01	U	NA		0.011		NA		0.031		NA		NA	
Uranium 238 Activity	pCi/L	--	0.744	**1.5**		NA		0.5		NA		0.5	U	NA		0.5		NA		**1.4**		NA		NA	
Uranium 238 Content	µCi/L	--	--	4.3		NA		1.4		NA		1.3	U	NA		1.4		NA		4.2		NA		NA	
Total Uranium Activity	pCi/L	--	--	4.2		NA		1.1		NA		0.6	U	NA		1.3		NA		4.1		NA		NA	
Isotopic Uranium Content	µCi/L	--	--	4.4		NA		1.5		NA		1.4	U	NA		1.5		NA		4.2		NA		NA	

TABLE 4-21
Groundwater Sampling Laboratory Values for Radionuclide Parameters
Monitoring Wells
Remedial Investigation Report
ASARCO LLC Hayden, Arizona Plant Site

The data in this table are illustrated on figures 4-48 and 4-49.

	Location:	EPA Maximum Contaminant Level[1]	EPA Region IX Preliminary Remediation Goal[2]	Equipment Blank		Equipment Blank (ASARCO)[3]		Equipment Blank (CH2M HILL)[4]	
	Event:			Winter		Summer		Summer	
	Date:			3/3/06		8/29/06		9/1/06	
Parameter	**Units**			**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**
Gross Alpha Activity	pCi/L	15	--	0.4	U	0.4		1.2	
Adjusted Gross Alpha	pCi/L	--	--	0.6	U	NA		NA	
Gross Beta Activity	pCi/L	--	--	2.9	U	3	U	2.9	U
Radium 226 Activity	pCi/L	--	0.000823	***0.3***	U	***0.3***	U	***0.5***	U
Radium 228 Activity	pCi/L	--	0.0458	***0.3***	U	***0.4***	U	***0.3***	U
Combined Radium	pCi/L	5.0	--	0.3	U	0.4	U	0.5	U
Uranium 234 Activity	pCi/L	--	0.674	0.3	U	NA		NA	
Uranium 234 Content	µCi/L	--	--	0.0001	U	NA		NA	
Uranium 235 Activity	pCi/L	--	0.684	0.021	U	NA		NA	
Uranium 235 Content	µCi/L	--	--	0.01	U	NA		NA	
Uranium 238 Activity	pCi/L	--	0.744	0.5	U	NA		NA	
Uranium 238 Content	µCi/L	--	--	1.3	U	NA		NA	
Total Uranium Activity	pCi/L	--	--	0.6	U	NA		NA	
Isotopic Uranium Content	µCi/L	--	--	1.4	U	NA		NA	

Table Notes:
[1] EPA Maximum Contaminant Level, EPA 816-F-03-016, June 2003
[2] EPA Region IX Preliminary Remediation Goals, Tap Water, October 2004
[3] Equipment blank taken from ASARCO sampling equipment.
[4] Equipment blank taken from CH2M HILL sampling equipment.
[5] Bold values with bold outline exceed one or more of the comparison criteria.
[7] Bold italicized values have detection limits above one or more of the comparison criteria.
[8] -- = Not established
[9] NA = Not analyzed
[10] pCi/L = Picocuries per Liter
[11] U = Not detected; reporting limit is shown in place of a result.
[12] µCi/L = Microcuries per Liter

TABLE 4-22
Groundwater Sampling Laboratory Values for Inorganic and Field Parameters
Water Supply Wells and Drinking Fountains
Remedial Investigation Report
ASARCO LLC Hayden, Arizona Plant Site

The data in this table are illustrated on figures 4-48, 4-49, 4-52, 4-53, and 4-54.

	Location:	EPA Maximum Contaminant Level[1]	EPA Region IX Preliminary Remediation Goal[2]	Hayden Library				HWF-15				HWF-21								HWF-26			
	Event:			Winter		Summer		Winter		Summer		Winter		Winter (Duplicate)		Summer		Summer (Duplicate)		Winter		Summer	
	Date:			3/2/06		8/29/06		3/2/06		8/31/06		3/2/06		3/2/06		8/31/06		8/31/06		3/2/06		9/13/06	
Parameter	Units			Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual
Aluminum	µg/L	50 [3]	36,000	16	J	***200***	U	20	U	***200***	UJ	20	U	20	U	***200***	UJ	***200***	UJ	20	U	***200***	U
Antimony	µg/L	6.0	15	1	U	0.16	UJ	1	U	0.14	UJ	1	U	1	U	0.28	UJ	0.27	UJ	1	U	0.39	UJ
Arsenic	µg/L	10	0.045	**4.5**		**3.8**		**3.9**		**3.6**		**4.1**		**4.2**		**3.8**		**3.8**		**3.5**		**3.2**	
Barium	µg/L	2,000	2,600	39		46.9		50		59.8	J	28		27		46.7	J	46.5	J	70		56.8	
Beryllium	µg/L	4.0	73	0.25	J	1	U	0.5	U	0.02	UJ	0.5	U	0.5	U	1	U	0.04	UJ	0.5	U	0.04	UJ
Boron	µg/L	--	7,300	190		189		230		179		190		190		193		193		210		253	
Cadmium	µg/L	5.0	18	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Calcium	µg/L	--	--	110,000		105,000		120,000		114,000		91,000		91,000		116,000		113,000		190,000		147,999	
Chromium	µg/L	100	--	1.8		0.79	J	2.1		1.7	J	1	U	1	U	0.23	J	0.23	J	1.5		1.2	UJ
Cobalt	µg/L	--	730	0.44	J	0.21	UJ	0.25	J	0.21	UJ	0.5	U	0.3	J	0.23	UJ	0.22	UJ	0.37	J	0.62	UJ
Copper	µg/L	1,000 [3]	1,500	77		75.8	J	3.3		7.6		1.8	J	2.5		4.1		3.7		2.4		3.7	
Cyanide	µg/L	200	730	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U
Iron	µg/L	300 [3]	11,000	100	U	100	U	100	U	100	UJ	100	U	100	U	100	UJ	100	UJ	100	U	100	U
Lead	µg/L	15	--	2	U	0.56	UJ	2	U	0.21	UJ	2	U	2	U	0.19	UJ	0.16	UJ	2	U	0.24	UJ
Magnesium	µg/L	--	--	23,000		22,300		27,000		24,200		21,000		21,000		27,100		26,400		44,000		31,800	
Manganese	µg/L	50 [3]	880	3		2.5		2	U	0.78	UJ	3.1		3.5		2.8		3		8.1		5.2	
Mercury	µg/L	2.0	11	0.03	U	0.2	U	0.03	U	0.2	U	0.03	U	0.03	U	0.2	U	0.2	U	0.03	U	0.2	U
Molybdenum	µg/L	--	180	35		33.3		51		73.8		6.6		6.6		6.5		6.8		47		52.5	
Nickel	µg/L	--	730	20	U	1.4		20	U	1.7		20	U	20	U	1.3		1.4		40	U	4.8	
Potassium	µg/L	--	--	7,500		6,680	J	11,000		9,860	J	5,100		5,100		6,090	J	6,000	J	9,600		8,550	J
Selenium	µg/L	50	180	5		3.1	J	7.2		4.3	J	1.6		2.1		2.7	J	2.4	J	6		7.3	
Silver	µg/L	100 [3]	180	0.5	U	1	U	0.5	U	1	U	0.5	U	0.5	U	0.01	UJ	1	U	0.5	U	1	U
Sodium	µg/L	--	--	160,000		153,999		190,000		186,999		140,000		130,000		174,999		171,999		200,000		188,000	
Thallium	µg/L	2.0	2.4	***2***	U	1	U	***2***	U	0.03	UJ	***2***	U	***2***	U	0.04	UJ	0.03	UJ	***2***	U	0.08	UJ
Thorium	µg/L	--	--	2	U	NA		2	U	NA		2	U	2	U	NA		NA		2	U	NA	
Uranium	µg/L	30	7.3	4.5		NA		4		NA		**8.1**		**8.2**		NA		NA		5.7		NA	
Vanadium	µg/L	--	36	5.5		8.6		6		9.9		3.3	J	3.3	J	7.5		7.6		4.7		7.7	
Zinc	µg/L	5,000 [3]	11,000	7.2		6.7	J	5	U	4.3		5	U	5	U	1.9	UJ	3.6		9.9		8.1	
Dissolved Aluminum	µg/L	50 [3]	36,000	20	U	***200***	U	20	U	***200***	U	20	U	20	U	***200***	U	***200***	U	20	U	***200***	U
Dissolved Antimony	µg/L	6.0	15	1	U	0.19	UJ	1	U	0.13	UJ	1	U	1	U	0.22	UJ	0.23	UJ	1	U	0.37	UJ
Dissolved Arsenic	µg/L	10	0.045	**4.2**		**3.5**		**3.9**		**3.4**		**4**		**3.9**		**3.5**		**3.4**		**3.1**		**2.8**	
Dissolved Barium	µg/L	2,000	2,600	39		50.2		48		55.9		27		26		45.4		42.4		65		56.5	J
Dissolved Beryllium	µg/L	4.0	73	0.5	U	0.03	UJ	0.5	U	1	U	0.5	U	0.5	U	1	U	1	U	0.5	U	0.05	UJ
Dissolved Boron	µg/L	--	7,300	190		144		230		277		190		180		195		208		200		255	
Dissolved Cadmium	µg/L	5.0	18	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Dissolved Calcium	µg/L	--	--	110,000		101,000		120,000		99,999		91,000		88,000		111,999		110,000		180,000		147,000	

TABLE 4-22
Groundwater Sampling Laboratory Values for Inorganic and Field Parameters
Water Supply Wells and Drinking Fountains
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ASARCO LLC Hayden, Arizona Plant Site

The data in this table are illustrated on figures 4-48, 4-49, 4-52, 4-53, and 4-54.

	Location:	EPA Maximum Contaminant Level[1]	EPA Region IX Preliminary Remediation Goal[2]	Hayden Library				HWF-15				HWF-21								HWF-26			
	Event:			Winter		Summer		Winter		Summer		Winter		Winter (Duplicate)		Summer		Summer (Duplicate)		Winter		Summer	
	Date:			3/2/06		8/29/06		3/2/06		8/31/06		3/2/06		3/2/06		8/31/06		8/31/06		3/2/06		9/13/06	
Parameter	Units			Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual
Dissolved Chromium	µg/L	100	--	1.7		0.43	J	2.2		1.5	UJ	1	U	0.56	J	0.09	UJ	0.07	UJ	1.5		0.98	UJ
Dissolved Cobalt	µg/L	--	730	0.34	J	0.43	UJ	0.3	J	0.25	UJ	0.5	U	0.27	J	0.22	UJ	0.22	UJ	0.32	J	0.61	UJ
Dissolved Copper	µg/L	1,000 [3]	1,500	66		284		3.4		0.65	UJ	2.2		2.4		2	U	2	U	3		4.2	
Dissolved Iron	µg/L	300 [3]	11,000	100	U	100	U	100	U	100	UJ	100	U	100	U	100	UJ	100	UJ	100	U	100	U
Dissolved Lead	µg/L	15	--	2	U	0.49	UJ	2	U	0.34	UJ	2	U	2	U	0.15	UJ	0.14	UJ	2	U	0.3	UJ
Dissolved Magnesium	µg/L	--	--	24,000		24,300		27,000		21,700		22,000		21,000		26,600		25,900		42,000		31,800	
Dissolved Manganese	µg/L	50 [3]	880	2.3		0.86	UJ	2	U	0.92	J	3.2		3.3		2.8		3.3		7.2		4.6	
Dissolved Mercury	µg/L	2.0	11	0.03	U	0.2	U	0.03	U	0.07	J	0.03	U	0.03	U	0.2	U	0.034	J	0.03	U	0.2	U
Dissolved Molybdenum	µg/L	--	180	34		29.2		50		70.3		6.3		6.3		6.5		6.1		45		53.4	
Dissolved Nickel	µg/L	--	730	20	U	3.9		20	U	2.1		20	U	20	U	1.5		1.6		40	U	5.1	
Dissolved Potassium	µg/L	--	--	7,900		7,030	J	10,000		9,500	J	5,000		4,800	J	6,360	J	6,120	J	8,900		8,570	J
Dissolved Selenium	µg/L	50	180	4.9		4	UJ	7.1		4.2	J	1.7		1.8		2.2	J	2.2	J	5.5		6.4	
Dissolved Silver	µg/L	100 [3]	180	0.5	U	0.02	UJ	0.5	U	1	U	0.5	U	0.5	U	1	U	1	U	0.5	U	1	U
Dissolved Sodium	µg/L	--	--	160,000		159,000		180,000		177,999		140,000		120,000		177,999		174,000		180,000		189,000	
Dissolved Thallium	µg/L	2.0	2.4	***2***	U	1	U	***2***	U	0.02	UJ	***2***	U	***2***	U	0.01	UJ	1	U	***2***	U	0.03	UJ
Dissolved Thorium	µg/L	--	--	2	U	NA		2	U	NA		2	U	2	U	NA		NA		2	U	NA	
Dissolved Uranium	µg/L	30	7.3	5.1		NA		4.8		NA		**9**		**8.6**		NA		NA		7		NA	
Dissolved Vanadium	µg/L	--	36	5		6.9		5.6		9.8		3.1	J	3.2	J	7.1		7		4.4		7.2	
Dissolved Zinc	µg/L	5,000 [3]	11,000	5.8		16.9	J	5	U	7.6		5	U	2.6	J	3.1		1.8	J	11		9.1	
pH		<6.5 or >8.5 [3]	--	7.73		7.76		7.82		6.94		7.81		NA		7.38		NA		7.82		7.79	
Conductivity	mS/cm	--	--	1.61		1.62		1.82		2.22		1.29		NA		1.86		NA		2.22		2.35	

TABLE 4-22
Groundwater Sampling Laboratory Values for Inorganic and Field Parameters
Water Supply Wells and Drinking Fountains
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ASARCO LLC Hayden, Arizona Plant Site

The data in this table are illustrated on figures 4-48, 4-49, 4-52, 4-53, and 4-54.

	Location:	EPA Maximum Contaminant Level[1]	EPA Region IX Preliminary Remediation Goal[2]	Hayden Wellfield Manifold				WM-3				WM-4				Winkelman Elementary School				Winkelman Wellfield Manifold			
	Event:			Winter		Summer		Winter		Summer		Winter		Summer		Winter		Summer		Winter		Summer	
	Date:			3/2/06		8/31/06		3/3/06		8/31/06		3/3/06		9/12/06		3/2/06		9/1/06		3/3/06		9/12/06	
Parameter	Units			Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual
Aluminum	µg/L	50 [3]	36,000	20	U	***200***	UJ	20	U	***200***	UJ	20	U	***200***	U	20	U	***200***	U	20	U	27.1	UJ
Antimony	µg/L	6.0	15	1	U	0.13	UJ	1	U	0.16	UJ	1	U	0.2	UJ	1	U	0.14	UJ	1	U	0.19	UJ
Arsenic	µg/L	10	0.045	**4.2**		**3.6**		**5**		**3.8**		**4.4**		**3.6**		**4.8**		**3.9**		**4.5**		**3.8**	
Barium	µg/L	2,000	2,600	40		51.6	J	22		38.8	J	29		49.4		28		34		25		42.5	
Beryllium	µg/L	4.0	73	0.5	U	1	U	0.5	U	0.02	UJ	0.5	U	1	U	0.5	U	1	U	0.5	U	0.04	UJ
Boron	µg/L	--	7,300	190		197		150		147		180		222		170		161		170		194	
Cadmium	µg/L	5.0	18	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Calcium	µg/L	--	--	110,000		110,000		57,000		75,600		85,000		95,600		75,000		75,100		72,000		89,500	
Chromium	µg/L	100	--	1.5		1.6	J	1	U	0.24	J	1	U	0.29	UJ	1	U	0.2	J	1	U	0.31	UJ
Cobalt	µg/L	--	730	0.5	U	0.18	UJ	0.5	U	0.13	UJ	0.5	U	0.54	UJ	0.5	U	0.14	UJ	0.5	U	0.51	UJ
Copper	µg/L	1,000 [3]	1,500	1.9	J	2.7		3.2		9.6		20		8.9		310		261	J	6.9		16.3	
Cyanide	µg/L	200	730	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U
Iron	µg/L	300 [3]	11,000	100	U	100	UJ	100		100	UJ	100	U	178		100	U	100	U	100	U	148	
Lead	µg/L	15	--	2	U	0.04	UJ	2	U	0.65	UJ	8.2		0.39	UJ	2	U	1.1		2	U	0.85	UJ
Magnesium	µg/L	--	--	23,000		23,400		15,000		18,600		21,000		20,500		18,000		18,600		17,000		19,700	
Manganese	µg/L	50 [3]	880	1.2	J	0.77	UJ	14		7.4		**100**		**278**		**110**		4.8		**51**		**177**	
Mercury	µg/L	2.0	11	0.03	U	0.2	U	0.03	U	0.2	U	0.03	U	0.2	U	0.03	U	0.2	U	0.03	U	0.2	U
Molybdenum	µg/L	--	180	33		70.5		9		10.2		16		29		11		11.4		12		19.3	
Nickel	µg/L	--	730	20	U	1.3		20	U	1.2		20	U	4.2		20	U	2.5		20	U	3.8	
Potassium	µg/L	--	--	7,800		9,520	J	5,200		5,140	J	6,600		6,870	J	6,200		5,350	J	5,900		6,180	J
Selenium	µg/L	50	180	4.5		4	J	0.81	J	1.5	J	0.97	J	1.4	J	0.73	J	1	J	0.7	J	1.4	J
Silver	µg/L	100 [3]	180	0.5	U	1	U	0.5	U	1	U	0.5	U	1	U	0.5	U	1	U	0.5	U	1	U
Sodium	µg/L	--	--	140,000		183,000		130,000		159,999		150,000		174,000		140,000		155,000		140,000		168,999	
Thallium	µg/L	2.0	2.4	***2***	U	0.02	UJ	***2***	U	0.02	UJ	***2***	U	0.06	UJ	***2***	U	1	U	***2***	U	0.05	UJ
Thorium	µg/L	--	--	2	U	NA		2	U	NA		2	U	NA		2	U	NA		2	U	NA	
Uranium	µg/L	30	7.3	4.6		NA		3.3		NA		3.9		NA		3.6		NA		3.5		NA	
Vanadium	µg/L	--	36	4.9		9.9		5.1		8.5		4.9		6.3		5		8.6		4.7		7.5	
Zinc	µg/L	5,000 [3]	11,000	5	U	1.9	UJ	7.9		6.9		54		2.2		16		32.6	J	5	U	4.6	
Dissolved Aluminum	µg/L	50 [3]	36,000	20	U	***200***	U	NA		***200***	U	20	U	25.8	UJ	20	U	***200***	U	20	U	***200***	U
Dissolved Antimony	µg/L	6.0	15	1	U	0.12	UJ	NA		0.14	UJ	1	U	0.16	UJ	1	U	0.16	UJ	1	U	0.16	UJ
Dissolved Arsenic	µg/L	10	0.045	**4.2**		**3.6**		NA		**3.3**		**4.5**		**2.1**		**4.4**		**3.4**		**3**		**2.7**	
Dissolved Barium	µg/L	2,000	2,600	49		54.5		NA		34.4		34		44.1	J	27		37		10		37	J
Dissolved Beryllium	µg/L	4.0	73	0.5	U	1	U	NA		1	U	0.5	U	0.02	UJ	0.5	U	0.03	UJ	0.5	U	1	U
Dissolved Boron	µg/L	--	7,300	190		226		NA		159		170		199		150		131		52	J	200	
Dissolved Cadmium	µg/L	5.0	18	1	U	1	U	NA		1	U	1	U	1	U	1	U	1	U	1	U	0.02	UJ
Dissolved Calcium	µg/L	--	--	110,000		104,000		NA		73,200		74,000		94,400		56,000		70,000		130,000		94,000	

TABLE 4-22
Groundwater Sampling Laboratory Values for Inorganic and Field Parameters
Water Supply Wells and Drinking Fountains
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ASARCO LLC Hayden, Arizona Plant Site

The data in this table are illustrated on figures 4-48, 4-49, 4-52, 4-53, and 4-54.

	Location:	EPA Maximum Contaminant Level[1]	EPA Region IX Preliminary Remediation Goal[2]	Hayden Wellfield Manifold				WM-3				WM-4				Winkelman Elementary School				Winkelman Wellfield Manifold			
	Event:			Winter		Summer		Winter		Summer		Winter		Summer		Winter		Summer		Winter		Summer	
	Date:			3/2/06		8/31/06		3/3/06		8/31/06		3/3/06		9/12/06		3/2/06		9/1/06		3/3/06		9/12/06	
Parameter	Units			Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual
Dissolved Chromium	µg/L	100	--	1.4		1.6	UJ	NA		0.09	UJ	1	U	0.1	UJ	1	U	2	U	2.2		0.13	UJ
Dissolved Cobalt	µg/L	--	730	0.5	U	0.23	UJ	NA		0.14	UJ	0.5	U	0.5	UJ	0.5	U	0.31	UJ	0.46	J	0.46	UJ
Dissolved Copper	µg/L	1,000 [3]	1,500	2.3		2	U	NA		2	U	370		8		4.7		200		1.2	J	6	
Dissolved Iron	µg/L	300 [3]	11,000	100	U	100	UJ	NA		100	UJ	53	J	100	U	100	U	100	U	100	U	100	U
Dissolved Lead	µg/L	15	--	2	U	0.07	UJ	NA		0.15	UJ	2	U	0.15	UJ	2	U	0.59	UJ	2	U	0.09	UJ
Dissolved Magnesium	µg/L	--	--	24,000		22,500		NA		18,300		18,000		20,400		14,000		19,800		200,000		20,500	
Dissolved Manganese	µg/L	50 [3]	880	1.5	J	0.8	J	NA		5.2		**140**		**75.1**		4.4		1.2		17		38.4	
Dissolved Mercury	µg/L	2.0	11	0.03	U	0.2	U	NA		0.048	J	0.03	U	0.2	U	0.03	U	0.2	U	0.03	U	0.2	U
Dissolved Molybdenum	µg/L	--	180	33		73		NA		10.2		12		23.1		9.2		10.6		1.4		16.1	
Dissolved Nickel	µg/L	--	730	20	U	1.7		NA		1.4		20	U	4.3		20	U	3.6		40	U	4.1	
Dissolved Potassium	µg/L	--	--	7,800		9,780	J	NA		5,440	J	5,900		6,890	J	5,100		5,850	J	5,900		6,550	J
Dissolved Selenium	µg/L	50	180	4.6		3.9	J	NA		0.93	J	0.69	J	0.96	J	0.53	J	1.7	UJ	**54**		0.96	J
Dissolved Silver	µg/L	100 [3]	180	0.5	U	1	U	NA		1	U	0.5	U	1	U	0.5	U	1	U	0.5	U	1	U
Dissolved Sodium	µg/L	--	--	140,000		183,999		NA		164,000		140,000		174,000		130,000		164,000		60,000		177,000	
Dissolved Thallium	µg/L	2.0	2.4	***2***	U	0.01	UJ	NA		0.02	UJ	***2***	U	0.04	UJ	***2***	U	1	U	***2***	U	0.03	UJ
Dissolved Thorium	µg/L	--	--	2	U	NA		NA		NA		2	U	NA		2	U	NA		2	U	NA	
Dissolved Uranium	µg/L	30	7.3	4.3		NA		NA		NA		3.3		NA		3.1		NA		1		NA	
Dissolved Vanadium	µg/L	--	36	5.2		10		NA		8.1		5.2		4.9		5.3		7		32		5.8	
Dissolved Zinc	µg/L	5,000 [3]	11,000	2.6	J	2.9		NA		2.2		16		2.2		4.8	J	24.8	J	4.3	J	2.1	
pH		<6.5 or >8.5 [3]	--	7.82		6.93		7.91		7.38		7.94		7.15		7.74		7.75		7.94		6.59	
Conductivity	mS/cm	--	--	1.53		2.72		1.21		1.86		1.5		1.44		1.51		1.55		1.5		1.46	

Table Notes:

[1] EPA Maximum Contaminant Level, EPA 816-F-03-016, June 2003
[2] EPA Region IX Preliminary Remediation Goals, Tap Water, October 2004
[3] Secondary MCL
[4] Bold values with bold outline exceed one or more of the comparison criteria.
[5] Bold italicized values have detection limits above one or more of the comparison criteria.
[6] -- = Not established
[7] J = Estimated value
[8] mS/cm = millisiemens per centimeter
[9] NA = Not analyzed
[10] U = Not detected; reporting limit is shown in place of a result.
[11] µg/L = micrograms per Liter
[12] UJ = Not detected; reporting limit is approximate and is shown in place of a result.

TABLE 4-23
Groundwater Sampling Laboratory Values for Volatile Organic Compound Parameters
Water Supply Wells and Manifolds
Remedial Investigation Report
ASARCO LLC Hayden, Arizona Plant Site

The data in this table are illustrated on figures 4-48 and 4-49.

Location:		EPA Maximum Contaminant Level[1]	EPA Region IX Preliminary Remediation Goal[2]	HWF-15				HWF-26				Hayden Wellfield Manifold				Winkelman Wellfield Manifold			
Event:				Winter		Summer		Winter		Summer		Winter		Summer		Winter		Summer	
Date:				3/2/06		8/31/06		3/2/06		9/13/06		3/2/06		8/31/06		3/3/06		9/12/06	
Parameter	Units			Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual
1,1,1-Trichloroethane	µg/L	200	3,200	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U
1,1,2,2-Tetrachloroethane	µg/L	--	0.055	***0.50***	U	***0.50***	U	***0.50***	U	***0.50***	U	***0.50***	U	***0.50***	U	***0.50***	U	***0.50***	U
1,1,2-Trichloroethane	µg/L	5.0	0.20	***0.50***	U	***0.50***	U	***0.50***	U	***0.50***	U	***0.50***	U	***0.50***	U	***0.50***	UJ	R	
1,1-Dichloroethane	µg/L	--	810	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U
1,1-Dichloroethene	µg/L	7.0	340	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U
1,2,3-Trichlorobenzene	µg/L	--	--	0.50	UJ	0.50	U	0.50	UJ	0.50	U	0.50	UJ	0.50	U	0.50	UJ	0.50	U
1,2,4-Trichlorobenzene	µg/L	70	7.2	0.50	UJ	0.50	U	0.50	UJ	0.50	U	0.50	UJ	0.50	U	0.50	UJ	0.50	U
1,2-Dibromo-3-chloropropane	µg/L	0.20	0.048	***0.050***	U	***0.050***	U	***0.050***	U	***0.050***	U	***0.050***	U	***0.050***	U	***0.050***	U	***0.050***	U
1,2-Dibromoethane	µg/L	0.05	0.0056	***0.050***	U	***0.050***	U	***0.050***	U	***0.050***	U	***0.050***	U	***0.050***	U	***0.050***	U	**0.036**	J
1,2-Dichlorobenzene	µg/L	600	370	0.50	UJ	0.50	U	0.50	UJ	0.50	U	0.50	UJ	0.50	U	0.50	UJ	0.50	U
1,2-Dichloroethane	µg/L	5.0	0.12	***0.50***	U	***0.50***	U	***0.50***	U	***0.50***	U	***0.50***	U	***0.50***	U	***0.50***	U	***0.50***	U
1,2-Dichloropropane	µg/L	5.0	0.16	***0.50***	U	***0.50***	U	***0.50***	U	***0.50***	U	***0.50***	U	***0.50***	U	***0.50***	U	***0.50***	U
1,3-Dichlorobenzene	µg/L	--	180	0.50	UJ	0.50	U	0.50	UJ	0.50	U	0.50	UJ	0.50	U	0.50	UJ	0.50	U
1,4-Dichlorobenzene	µg/L	75	0.50	***0.50***	UJ	***0.50***	U	***0.50***	UJ	***0.50***	U	***0.50***	UJ	***0.50***	U	***0.50***	UJ	***0.50***	U
1,4-Dioxane	µg/L	--	6.1	2.0	U	R		2.0	U	R		2.0	U	R		2.0	U	4.0	J
2-Butanone	µg/L	--	7,000	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U
2-Hexanone	µg/L	--	--	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U
4-Methyl-2-pentanone	µg/L	--	2,000	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U
Acetone	µg/L	--	5,500	5.0	U	R		5.0	U	R		5.0	U	R		5.3	UJ	9.4	J
Benzene	µg/L	5.0	0.35	***0.50***	U	***0.50***	U	***0.50***	U	***0.50***	U	***0.50***	U	***0.50***	U	***0.50***	U	***0.50***	U
Bromochloromethane	µg/L	--	--	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U
Bromodichloromethane	µg/L	--	0.18	***0.50***	U	***0.50***	U	***0.50***	U	***0.50***	U	***0.50***	U	***0.50***	U	**2.5**		**1.7**	
Bromoform	µg/L	--	8.5	0.50	UJ	0.50	U	0.50	UJ	0.50	U	0.50	UJ	0.50	U	0.50	UJ	0.24	J
Bromomethane	µg/L	--	8.7	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.27	J
Carbon disulfide	µg/L	--	1,000	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U
Carbon tetrachloride	µg/L	5.0	0.17	***0.50***	U	***0.50***	U	***0.50***	U	***0.50***	U	***0.50***	U	***0.50***	U	***0.50***	U	***0.50***	U
Chlorobenzene	µg/L	100	110	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U
Chlorodibromomethane	µg/L	--	0.13	***0.50***	U	***0.50***	U	***0.50***	U	***0.50***	U	***0.50***	U	***0.50***	U	**2.4**		**1.2**	
Chloroethane	µg/L	--	4.6	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U
Chloroform	µg/L	--	0.17	***0.50***	U	***0.50***	U	***0.50***	U	***0.50***	U	***0.50***	U	***0.50***	U	***1.2***	UJ	***0.50***	U
Chloromethane	µg/L	--	160	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.67		0.40	J
cis-1,2-Dichloroethene	µg/L	70	61	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	R	
cis-1,3-Dichloropropene	µg/L	--	--	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	UJ	R	
Cyclohexane	µg/L	--	10,000	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U
Dichlorodifluoromethane	µg/L	--	390	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U
Ethylbenzene	µg/L	700	1,300	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	UJ	R	

TABLE 4-23
Groundwater Sampling Laboratory Values for Volatile Organic Compound Parameters
Water Supply Wells and Manifolds
Remedial Investigation Report
ASARCO LLC Hayden, Arizona Plant Site

The data in this table are illustrated on figures 4-48 and 4-49.

	Location:	EPA Maximum Contaminant Level[1]	EPA Region IX Preliminary Remediation Goal[2]	HWF-15				HWF-26				Hayden Wellfield Manifold				Winkelman Wellfield Manifold			
	Event:			Winter		Summer		Winter		Summer		Winter		Summer		Winter		Summer	
	Date:			3/2/06		8/31/06		3/2/06		9/13/06		3/2/06		8/31/06		3/3/06		9/12/06	
Parameter	**Units**			**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**
Isopropylbenzene	µg/L	--	660	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	UJ	R	
m,p-Xylene	µg/L	--	--	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	UJ	R	
Methyl acetate	µg/L	--	6,100	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U
Methyl tert-butyl ether	µg/L	--	11	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U
Methylcyclohexane	µg/L	--	5,200	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U
Methylene Chloride	µg/L	5.0	4.3	1.2	UJ	0.50	U	0.50	UJ	0.50	U	0.50	UJ	0.50	U	0.50	UJ	0.15	J
o-Xylene	µg/L	--	--	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	UJ	R	
Styrene	µg/L	100	1,600	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	UJ	R	
Tetrachloroethene	µg/L	5.0	0.10	***0.50***	U	***0.50***	U	***0.50***	U	***0.50***	U	***0.50***	U	***0.50***	U	***0.50***	UJ	R	
Toluene	µg/L	1,000	720	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	UJ	R	
trans-1,2-Dichloroethene	µg/L	100	120	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	R	
trans-1,3-Dichloropropene	µg/L	--	--	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	UJ	R	
Trichloroethene	µg/L	5.0	0.028	***0.50***	U	***0.50***	U	***0.50***	U	***0.50***	U	***0.50***	U	***0.50***	U	***0.50***	UJ	R	
Trichlorofluoromethane	µg/L	--	1,300	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U
Trichlorotrifluoroethane	µg/L	--	59,000	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U	0.50	U
Vinyl chloride	µg/L	2.0	0.02	***0.50***	U	***0.50***	U	***0.50***	U	***0.50***	U	***0.50***	U	***0.50***	U	R		R	

Table Notes:
[1] EPA Maximum Contaminant Level, EPA 816-F-03-016, June 2003
[2] EPA Region IX Preliminary Remediation Goals, Tap Water, October 2004
[3] Bold values with bold outline exceed one or more of the comparison criteria.
[4] Bold italicized values have detection limits above one or more of the comparison criteria.
[5] -- = Not established
[6] J = Estimated value
[7] R = Rejected
[8] U = Not detected; reporting limit is shown in place of a result.
[9] µg/L = micrograms per Liter
[10] UJ = Not detected; reporting limit is approximate and is shown in place of a result.

TABLE 4-24
Groundwater Sampling Laboratory Values for Semi-Volatile Organic Compound Parameters
Water Supply Wells and Mainfolds
Remedial Investigation Report
ASARCO LLC Hayden, Arizona Plant Site

	Location:	EPA Maximum Contaminant Level[1]	EPA Region IX Preliminary Remediation Goal[2]	HWF-15		HWF-26				Hayden Wellfield Manifold		Winkelman Wellfield Manifold			
	Event:			Summer		Winter		Summer		Summer		Winter		Summer	
	Date:			8/31/06		3/2/06		9/13/06		8/31/06		3/3/06		9/12/06	
Parameter	Units			Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual
1,1'-Biphenyl	µg/L	--	300	5.0	U	5.0	UJ	5.0	U	5.0	U	5.0	U	5.0	U
1,2,4,5-Tetrachlorobenzene	µg/L	--	11	5.0	U	5.0	UJ	5.0	U	5.0	U	5.0	U	5.0	U
2,2'-Oxybis(1-chloropropane)	µg/L	--	0.27	***5.0***	U	***5.0***	UJ	***5.0***	U	***5.0***	U	***5.0***	U	***5.0***	U
2,3,4,6-Tetrachlorophenol	µg/L	--	1,100	5.0	U	5.0	UJ	5.0	U	5.0	U	5.0	U	5.0	U
2,4,5-Trichlorophenol	µg/L	--	3,600	5.0	U	5.0	UJ	5.0	U	5.0	U	5.0	U	5.0	U
2,4,6-Trichlorophenol	µg/L	--	3.6	***5.0***	U	***5.0***	UJ	***5.0***	U	***5.0***	U	***5.0***	U	***5.0***	U
2,4-Dichlorophenol	µg/L	--	110	5.0	U	5.0	UJ	5.0	U	5.0	U	5.0	U	5.0	U
2,4-Dimethylphenol	µg/L	--	730	5.0	U	5.0	UJ	5.0	U	5.0	U	5.0	U	5.0	U
2,4-Dinitrophenol	µg/L	--	73	10	U	R		10	U	10	U	R		10	U
2,4-Dinitrotoluene	µg/L	--	73	5.0	U	5.0	UJ	5.0	U	5.0	U	5.0	U	5.0	U
2,6-Dinitrotoluene	µg/L	--	36	5.0	U	5.0	UJ	5.0	U	5.0	U	5.0	U	5.0	U
2-Chloronaphthalene	µg/L	--	490	5.0	U	5.0	UJ	5.0	U	5.0	U	5.0	U	5.0	U
2-Chlorophenol	µg/L	--	30	5.0	U	5.0	UJ	5.0	U	5.0	U	5.0	U	5.0	U
2-Methylnaphthalene	µg/L	--	--	0.10	U	0.026	J	0.10	U	0.10	U	0.018	UJ	0.10	U
2-Methylphenol	µg/L	--	1,800	5.0	U	5.0	UJ	5.0	U	5.0	U	5.0	U	5.0	U
2-Nitroaniline	µg/L	--	110	10	U	10	UJ	10	U	10	U	10	U	10	U
2-Nitrophenol	µg/L	--	--	5.0	U	5.0	UJ	5.0	U	5.0	U	5.0	U	5.0	U
3,3'-Dichlorobenzidine	µg/L	--	0.15	***5.0***	U	***5.0***	UJ	***5.0***	U	***5.0***	U	***5.0***	U	***5.0***	U
3-Nitroaniline	µg/L	--	3.2	***10***	U	***10***	UJ	***10***	U	***10***	U	***10***	U	***10***	U
4,6-Dinitro-2-methylphenol	µg/L	--	3.6	***10***	U	***10***	UJ	***10***	U	***10***	U	***10***	U	***10***	U
4-Bromophenyl phenyl ether	µg/L	--	--	5.0	U	5.0	UJ	5.0	U	5.0	U	5.0	U	5.0	U
4-Chloro-3-methylphenol	µg/L	--	--	5.0	U	5.0	UJ	5.0	U	5.0	U	5.0	U	5.0	U
4-Chloroaniline	µg/L	--	150	5.0	U	5.0	UJ	5.0	U	5.0	U	5.0	U	5.0	U
4-Chlorophenyl phenyl ether	µg/L	--	--	5.0	U	5.0	UJ	5.0	U	5.0	U	5.0	U	5.0	U
4-Methylphenol	µg/L	--	180	5.0	U	5.0	UJ	5.0	U	5.0	U	5.0	U	5.0	U
4-Nitroaniline	µg/L	--	3.2	***10***	U	***10***	UJ	***10***	U	***10***	U	***10***	U	***10***	U
4-Nitrophenol	µg/L	--	--	10	U	10	UJ	10	U	10	U	10	U	10	U
Acenaphthene	µg/L	--	370	0.10	U	5.0	UJ	0.10	U	0.10	U	5.0	U	0.10	U
Acenaphthylene	µg/L	--	--	0.10	U	5.0	UJ	0.10	U	0.10	U	5.0	U	0.10	U
Acetophenone	µg/L	--	--	5.0	U	5.0	UJ	5.0	U	5.0	U	5.0	U	5.0	U
Anthracene	µg/L	--	1,800	0.10	U	5.0	UJ	0.10	U	0.10	U	5.0	U	0.10	U
Atrazine	µg/L	3.0	0.30	***5.0***	U	***5.0***	UJ	***5.0***	U	***5.0***	U	***5.0***	U	***5.0***	U
Benzaldehyde	µg/L	--	3,600	5.0	U	5.0	UJ	5.0	U	5.0	U	5.0	UJ	5.0	U
Benzo(a)anthracene	µg/L	--	0.092	***0.10***	U	***5.0***	UJ	***0.10***	U	***0.10***	U	***5.0***	U	***0.10***	U
Benzo(a)pyrene	µg/L	0.20	0.0092	***0.10***	U	***5.0***	UJ	***0.10***	U	***0.10***	U	***5.0***	U	***0.10***	U
Benzo(b)fluoranthene	µg/L	--	0.092	***0.10***	UJ	***5.0***	UJ	***0.10***	U	***0.10***	UJ	***5.0***	U	***0.10***	U
Benzo(g,h,i)perylene	µg/L	--	--	0.10	U	5.0	UJ	0.10	U	0.10	U	5.0	U	0.10	U
Benzo(k)fluoranthene	µg/L	--	0.92	0.10	U	***5.0***	UJ	0.10	U	0.10	U	***5.0***	U	0.10	U
Bis(2-chloroethoxy)methane	µg/L	--	--	5.0	U	5.0	UJ	5.0	U	5.0	U	5.0	U	5.0	U

TABLE 4-24
Groundwater Sampling Laboratory Values for Semi-Volatile Organic Compound Parameters
Water Supply Wells and Mainfolds
Remedial Investigation Report
ASARCO LLC Hayden, Arizona Plant Site

	Location:	EPA Maximum Contaminant Level[1]	EPA Region IX Preliminary Remediation Goal[2]	HWF-15		HWF-26				Hayden Wellfield Manifold		Winkelman Wellfield Manifold			
	Event:			Summer		Winter		Summer		Summer		Winter		Summer	
	Date:			8/31/06		3/2/06		9/13/06		8/31/06		3/3/06		9/12/06	
Parameter	Units			Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual
Bis(2-chloroethyl)ether	µg/L	--	0.01	***5.0***	U	***5.0***	UJ	***5.0***	U	***5.0***	U	***5.0***	U	***5.0***	U
bis(2-Ethylhexyl) phthalate	µg/L	6.0	4.8	***5.0***	U	***5.0***	UJ	***5.0***	U	***5.0***	U	0.44		1.9	J
Butyl benzyl phthalate	µg/L	--	7,300	5.0	U	5.0	UJ	5.0	U	5.0	U	5.0	U	5.0	U
Caprolactam	µg/L	--	18,000	5.0	U	5.0	UJ	5.0	U	5.0	U	0.38		5.0	U
Carbazole	µg/L	--	3.4	***5.0***	U	***5.0***	UJ	***5.0***	U	***5.0***	U	***5.0***	U	***5.0***	U
Chrysene	µg/L	--	9.2	0.10	U	5.0	UJ	0.10	U	0.10	U	5.0	U	0.10	U
Dibenzo(a,h)anthracene	µg/L	--	0.0092	***0.10***	U	***5.0***	UJ	***0.10***	U	***0.10***	U	***5.0***	U	***0.10***	U
Dibenzofuran	µg/L	--	12	5.0	U	5.0	UJ	5.0	U	5.0	U	5.0	U	5.0	U
Diethyl phthalate	µg/L	--	29,000	5.0	U	5.0	UJ	5.0	U	5.0	U	5.0	U	5.0	U
Dimethyl phthalate	µg/L	--	360,000	5.0	U	5.0	UJ	5.0	U	5.0	U	5.0	U	5.0	U
Di-n-butyl phthalate	µg/L	--	3,600	5.0	U	5.0	UJ	5.0	U	5.0	U	0.25		5.0	U
di-n-Octyl phthalate	µg/L	--	1,500	5.0	U	5.0	UJ	5.0	U	5.0	U	5.0	U	5.0	U
Fluoranthene	µg/L	--	1,500	0.10	U	5.0	UJ	0.10	U	0.10	U	5.0	U	0.10	U
Fluorene	µg/L	--	240	0.10	U	5.0	UJ	0.10	U	0.10	U	5.0	U	0.10	U
Hexachlorobenzene	µg/L	1.0	0.042	***5.0***	U	***5.0***	UJ	***5.0***	U	***5.0***	U	***5.0***	U	***5.0***	U
Hexachlorobutadiene	µg/L	--	0.86	***5.0***	U	***5.0***	UJ	***5.0***	U	***5.0***	U	***5.0***	U	***5.0***	U
Hexachlorocyclopentadiene	µg/L	50	220	5.0	U	5.0	UJ	5.0	U	5.0	U	5.0	U	5.0	U
Hexachloroethane	µg/L	--	4.8	***5.0***	U	***5.0***	UJ	***5.0***	U	***5.0***	U	***5.0***	U	***5.0***	U
Indeno(1,2,3-cd)pyrene	µg/L	--	0.092	***0.10***	U	***5.0***	UJ	***0.10***	U	***0.10***	U	***5.0***	U	***0.10***	U
Isophorone	µg/L	--	71	5.0	U	5.0	UJ	5.0	U	5.0	U	5.0	U	5.0	U
Naphthalene	µg/L	--	6.2	0.10	U	5.0	UJ	0.10	U	0.10	U	5.0	U	0.10	U
Nitrobenzene	µg/L	--	3.4	***5.0***	U	***5.0***	UJ	***5.0***	U	***5.0***	U	***5.0***	U	***5.0***	U
n-Nitroso-di-n-propylamine	µg/L	--	0.0096	***5.0***	U	***5.0***	UJ	***5.0***	U	***5.0***	U	***5.0***	U	***5.0***	U
n-Nitrosodiphenylamine	µg/L	--	14	5.0	U	5.0	UJ	5.0	U	5.0	U	5.0	U	5.0	U
Pentachlorophenol	µg/L	1.0	0.56	***10***	U	***10***	UJ	0.20	U	***10***	U	***10***	U	0.20	U
Phenanthrene	µg/L	--	--	0.10	U	5.0	UJ	0.10	U	0.10	U	5.0	U	0.10	U
Phenol	µg/L	--	11,000	5.0	U	5.0	UJ	5.0	U	5.0	U	5.0	UJ	5.0	U
Pyrene	µg/L	--	180	0.10	UJ	5.0	UJ	0.10	U	0.10	UJ	5.0	U	0.10	U

Table Notes:
[1] EPA Maximum Contaminant Level, EPA 816-F-03-016, June 2003
[2] EPA Region IX Preliminary Remediation Goals, Tap Water, October 2004
[3] Bold values with bold outline exceed one or more of the comparison criteria.
[4] Bold italicized values have detection limits above one or more of the comparison criteria.
[5] -- = Not established
[6] J = Estimated value
[7] R = Rejected
[8] U = Not detected; reporting limit is shown in place of a result.
[9] µg/L = micrograms per Liter
[10] UJ = Not detected; reporting limit is approximate and is shown in place of a result.

TABLE 4-25
Groundwater Sampling Laboratory Values for General Water Quality Parameters
Water Supply Wells, Manifolds, and Drinking Fountains
Remedial Investigation Report
ASARCO LLC Hayden, Arizona Plant Site

The data in this table are illustrated on figures 4-48, 4-49, 4-52, 4-53, and 4-54.

	Location:	EPA Maximum Contaminant Level[1]	EPA Region IX Preliminary Remediation Goal[2]	Hayden Library				HWF-15				HWF-21								HWF-26			
	Event:			Winter		Summer		Winter		Summer		Winter		Winter (Duplicate)		Summer		Summer (Duplicate)		Winter		Summer	
	Date:			3/2/06		8/29/06		3/2/06		8/31/06		3/2/06		3/2/06		8/31/06		8/31/06		3/2/06		9/13/06	
Parameter	**Units**			**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**
Bicarbonate Alkalinity	mg/L	--	--	240		NA		250		220		260		260		250		250		280		230	
Carbonate Alkalinity	mg/L	--	--	10	U	NA		10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U
Chloride	mg/L	250 [3]	--	170		NA		220		210		86		85		110		110		240		220	
Fluoride	mg/L	4.0	2.2	1.6		NA		1.7		1.9		1.6		1.6		1.6		1.6		2		2	
Hardness, as CaCO3	mg/L	--	--	370		NA		410		NA		310		310		NA		NA		660		NA	
Dissolved Hardness, as CaCO3	mg/L	--	--	370		NA		410		NA		320		310		NA		NA		620		NA	
Hydroxide Alkalinity	mg/L	--	--	10	U	NA		10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U
Sulfate	mg/L	250 [3]	--	**260**		NA		**290**		240		240		**250**		**330**		**330**		**490**		**320**	
Total Alkalinity	mg/L	--	--	240		NA		250		220		260		260		250		250		280		230	
Total Dissolved Solids	mg/L	500 [3]	--	**930**		**900**		**1,100**		**960**		**780**		**780**		**980**		**980**		**1,400**		**1,100**	

TABLE 4-25
Groundwater Sampling Laboratory Values for General Water Quality Parameters
Water Supply Wells, Manifolds, and Drinking Fountains
Remedial Investigation Report
ASARCO LLC Hayden, Arizona Plant Site

The data in this table are illustrated on figures 4-48, 4-49, 4-52, 4-53, and 4-54.

	Location:	EPA Maximum Contaminant Level[1]	EPA Region IX Preliminary Remediation Goal[2]	Hayden Wellfield Manifold				WM-3				WM-4				Winkelman Elementary School				Winkelman Wellfield Manifold			
	Event:			Winter		Summer		Winter		Summer		Winter		Summer		Winter		Summer		Winter		Summer	
	Date:			3/2/06		8/31/06		3/3/06		8/31/06		3/3/06		9/12/06		3/2/06		9/1/06		3/3/06		9/12/06	
Parameter	**Units**			**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**
Bicarbonate Alkalinity	mg/L	--	--	240		NA		210		190		220		200		210		NA		220		210	
Carbonate Alkalinity	mg/L	--	--	10	U	NA		10	U	10	U	10	U	10	U	10	U	NA		10	U	10	U
Chloride	mg/L	250 [3]	--	160		NA		180		220		240		**280**		210		NA		240		**270**	
Fluoride	mg/L	4.0	2.2	1.5		NA		1.2		1.1		1.3		1.4		1.2		NA		1.2		1.2	
Hardness, as CaCO3	mg/L	--	--	370		NA		200		NA		300		NA		260		NA		250		NA	
Dissolved Hardness, as CaCO3	mg/L	--	--	370		NA		NA		NA		260		NA		200		NA		1,100		NA	
Hydroxide Alkalinity	mg/L	--	--	10	U	NA		10	U	10	U	10	U	10	U	10	U	NA		10	U	10	U
Sulfate	mg/L	250 [3]	--	**260**		NA		93		110		140		190		130		NA		140		160	
Total Alkalinity	mg/L	--	--	240		NA		210		190		220		200		210		NA		220		210	
Total Dissolved Solids	mg/L	500 [3]	--	**900**		**950**		**640**		**740**		**830**		**840**		**760**		**750**		**760**		**840**	

Table Notes:

[1] EPA Maximum Contaminant Level, EPA 816-F-03-016, June 2003
[2] EPA Region IX Preliminary Remediation Goals, Tap Water, October 2004
[3] Secondary MCL
[4] Bold values with bold outline exceed one or more of the comparison criteria.
[5] -- = Not established
[6] mg/L = milligrams per Liter
[7] NA = Not analyzed
[8] U = Not detected; reporting limit is shown in place of a result.

TABLE 4-26
Groundwater Sampling Laboratory Values for Radionuclide Parameters
Water Supply Wells, Manifolds, and Drinking Fountains
Remedial Investigation Report
ASARCO LLC Hayden, Arizona Plant Site

The data in this table are illustrated on figures 4-48 and 4-49.

	Location:	EPA Maximum Contaminant Level[1]	EPA Region IX Preliminary Remediation Goal[2]	Hayden Library				HWF-15				HWF-21								HWF-26				Hayden Wellfield Manifold			
	Event:			Winter		Summer		Winter		Summer		Winter		Winter (Duplicate)		Summer		Summer (Duplicate)		Winter		Summer		Winter		Summer	
	Date:			3/2/06		8/29/06		3/2/06		8/31/06		3/2/06		3/2/06		8/31/06		8/31/06		3/2/06		9/13/06		3/2/06		8/31/06	
Parameter	Units			Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual
Gross Alpha Activity	pCi/L	15	--	4.8		4.9		4.1		5		8		7.1		8		7.6		5.5		6		4.7		3.9	
Adjusted Gross Alpha	pCi/L	--	--	2.3		NA		0.7		NA		1.3		2.7		NA		NA		1	U	NA		0.5		NA	
Gross Beta Activity	pCi/L	--	--	6.7		4.5		12.2		7.9		6.8		7		5.3		3.6	U	10.4		6.4		5.9		7.6	
Radium 226 Activity	pCi/L	--	0.000823	***0.3***	U	***0.2***	U	***0.4***	U	***0.4***	U	**0.5**		***0.3***	U	***0.3***	U	***0.2***	U	***0.5***	U	***0.6***	U	***0.4***	U	***0.3***	U
Radium 228 Activity	pCi/L	--	0.0458	***0.4***	U	***0.3***	U	***0.4***	U	***0.4***	U	***0.4***	U	***0.3***	U	***0.4***	U	***0.3***	U	***0.4***	U	***0.4***	U	***0.3***	U	***0.4***	U
Combined Radium	pCi/L	5.0	--	0.4	U	0.3	U	0.4	U	0.4	U	0.5		0.3	U	0.4	U	0.3	U	0.5	U	0.6	U	0.4	U	0.4	U
Uranium 234 Activity	pCi/L	--	0.674	**1.6**		NA		**2.4**		NA		**4.5**		**2.9**		NA		NA		**3.3**		NA		**2.7**		NA	
Uranium 234 Content	µCi/L	--	--	0.0003		NA		0.0004		NA		0.0007		0.0005		NA		NA		0.0005		NA		0.0004		NA	
Uranium 235 Activity	pCi/L	--	0.684	0.04		NA		0.48		NA		0.101		0.068		NA		NA		0.096		NA		0.068		NA	
Uranium 235 Content	µCi/L	--	--	0.019		NA		0.022		NA		0.047		0.032		NA		NA		0.045		NA		0.032		NA	
Uranium 238 Activity	pCi/L	--	0.744	**0.9**		NA		**1**		NA		**2.2**		**1.5**		NA		NA		**2.1**		NA		**1.5**		NA	
Uranium 238 Content	µCi/L	--	--	2.6		NA		3.1		NA		6.4		4.3		NA		NA		6.1		NA		4.3		NA	
Total Uranium Activity	pCi/L	--	--	2.5		NA		3.4		NA		6.7		4.4		NA		NA		5.5		NA		4.2		NA	
Isotopic Uranium Content	µCi/L	--	--	2.6		NA		3.1		NA		6.5		4.4		NA		NA		6.2		NA		4.4		NA	

TABLE 4-26
Groundwater Sampling Laboratory Values for Radionuclide Parameters
Water Supply Wells, Manifolds, and Drinking Fountains
Remedial Investigation Report
ASARCO LLC Hayden, Arizona Plant Site

The data in this table are illustrated on figures 4-48 and 4-49.

	Location:	EPA Maximum Contaminant Level[1]	EPA Region IX Preliminary Remediation Goal[2]	WM-3				WM-4				Winkelman Elementary School				Winkelman Wellfield Manifold			
	Event:			Winter		Summer		Winter		Summer		Winter		Summer		Winter		Summer	
	Date:			3/3/06		8/31/06		3/3/06		9/12/06		3/2/06		9/1/06		3/3/06		9/12/06	
Parameter	**Units**			**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**
Gross Alpha Activity	pCi/L	15	--	2.6		3.8		3.2		3.7		3.1		3.7		3.5		4.4	
Adjusted Gross Alpha	pCi/L	--	--	1	U	NA		1	U	NA		1	U	NA		1	U	NA	
Gross Beta Activity	pCi/L	--	--	5.5		5		3.6	U	4.7		5.4		4.3		7		4.2	
Radium 226 Activity	pCi/L	--	0.000823	***0.6***	U	***0.3***	U	***0.5***	U	***0.5***	U	***0.5***	U	***0.3***	U	***0.6***	U	***0.2***	U
Radium 228 Activity	pCi/L	--	0.0458	***0.4***	U	***0.4***	U	***0.3***	U	***0.3***	U	***0.4***	U	***0.4***	U	***0.4***	U	***0.3***	U
Combined Radium	pCi/L	5.0	--	0.6	U	0.4	U	0.5	U	0.5	U	0.5	U	0.4	U	0.6	U	0.3	U
Uranium 234 Activity	pCi/L	--	0.674	**2**		NA		**2.3**		NA		**2.2**		NA		**2.7**		NA	
Uranium 234 Content	µCi/L	--	--	0.0003		NA		0.0004		NA		0.0004		NA		0.0004		NA	
Uranium 235 Activity	pCi/L	--	0.684	0.038		NA		0.043		NA		0.038		NA		0.038		NA	
Uranium 235 Content	µCi/L	--	--	0.018		NA		0.02		NA		0.018		NA		0.018		NA	
Uranium 238 Activity	pCi/L	--	0.744	**0.8**		NA		**0.9**		NA		**0.8**		NA		**0.8**		NA	
Uranium 238 Content	µCi/L	--	--	2.4		NA		2.7		NA		2.4		NA		2.4		NA	
Total Uranium Activity	pCi/L	--	--	2.8		NA		3.3		NA		3.1		NA		3.6		NA	
Isotopic Uranium Content	µCi/L	--	--	2.4		NA		2.8		NA		2.4		NA		2.4		NA	

Table Notes:
[1] EPA Maximum Contaminant Level, EPA 816-F-03-016, June 2003
[2] EPA Region IX Preliminary Remediation Goals, Tap Water, October 2004
[3] Bold values with bold outline exceed one or more of the comparison criteria.
[4] Bold italicized values have detection limits above one or more of the comparison criteria.
[5] -- = Not established
[6] NA = Not analyzed
[7] pCi/L = Picocuries per Liter
[8] U = Not detected; reporting limit is shown in place of a result.
[9] µCi/L = Microcuries per Liter

TABLE 4-27
Groundwater Sampling Laboratory Value Exceedances
Monitoring Wells, Water Supply Wells and Drinking Fountains
Remedial Investigation Report
ASARCO LLC Hayden, Arizona Plant Site

The data in this table are illustrated on figures 4-48, 4-49, 4-50, 4-51, 4-52, 4-53, and 4-54.

	Location:		EPA Maximum Contaminant Level[1]	EPA Region IX Preliminary Remediation Goal[2]	GW-01(R)						GW-02				GW-03								GW-06			
	Event:				Winter		Summer		Summer		Winter		Summer		Winter		Winter (Duplicate)		Summer		Summer (Duplicate)		Winter		Summer	
	Date:				3/24/06		8/31/06		9/13/06		3/3/06		8/31/06		3/3/06		3/3/06		8/31/06-9/1/06		9/1/06		3/3/06		9/1/06	
	Parameter	Units			Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual
Inorganics	Aluminum	µg/L	50 [5]	36,000	NA		**29,900**		NA		NA		39.9	UJ	20		**52**		***200***	UJ	***200***	UJ	**1,800**		***75.7***	UJ
	Antimony	µg/L	6.0	15	NA		4	U	NA		NA		**9.2**		1	U	1	U	0.18	UJ	0.19	UJ	1	U	0.27	UJ
	Arsenic	µg/L	10	0.045	NA		**5.9**		NA		NA		**34.4**		**5.7**		**5.8**		**3.6**		**3.8**		**4**		**3**	
	Cadmium	µg/L	5.0	18	NA		0.21	J	NA		NA		**9.2**		1	U	1	U	1	U	1	U	1	U	1	U
	Iron	µg/L	300 [5]	11,000	NA		**22,400**		NA		NA		100	U	100	U	51	J	100	UJ	100	UJ	**1,600**		100	U
	Manganese	µg/L	50 [5]	880	NA		**1,030**		NA		NA		1.7		2	U	1.4	J	0.32	UJ	0.34	UJ	**91**		2.9	
	Molybdenum	µg/L	--	180	NA		6.3		NA		NA		**2,050**		13		12		14.1		14.4		3.6		2.7	
	Selenium	µg/L	50	180	NA		21.1		NA		NA		**92.2**		0.89	J	0.71	J	1.1	J	1.7	J	8.5		10.9	
	Uranium	µg/L	30	7.3	NA		NA		NA		NA		NA		4		4		NA		NA		1.2		NA	
	Vanadium	µg/L	--	36	NA		**90**		NA		NA		27.9		5		5.1		6.8		6.9		**39**		**47.6**	
	Dissolved Aluminum	µg/L	50	36,000	NA		***200***	U	NA		NA		***200***	U	20	U	20	U	***200***	U	***200***	U	**260**		***200***	U
	Dissolved Antimony	µg/L	6.0	15	NA		0.13	UJ	NA		NA		**10.4**		1	U	1	U	0.21	UJ	0.17	UJ	1	U	0.29	UJ
	Dissolved Arsenic	µg/L	10	0.045	NA		**5.1**		NA		NA		**31.7**		**5.3**		**5.6**		**3.7**		**3.8**		**2.6**		**3**	
	Dissolved Cadmium	µg/L	5.0	18	NA		0.02	J	NA		NA		**8.1**		1	U	1	U	1	U	1	U	1	U	0.05	J
	Dissolved Iron	µg/L	300 [5]	11,000	NA		100	U	NA		NA		100	U	100	U	100	U	100	UJ	100	UJ	250		100	U
	Dissolved Manganese	µg/L	50 [5]	880	NA		**298**		NA		NA		1.4		2	U	2	U	0.63	J	0.36	J	24		0.3	UJ
	Dissolved Molybdenum	µg/L	--	180	NA		13.9		NA		NA		**2,030**		13		13		12.3		12.9		4.8		2.4	
	Dissolved Selenium	µg/L	50	180	NA		30.4		NA		NA		**97.2**		0.99	J	0.84	J	0.95	J	1.1	J	9.6		13.6	
	Dissolved Uranium	µg/L	30	7.3	NA		NA		NA		NA		NA		4		4		NA		NA		1.1		NA	
	Dissolved Vanadium	µg/L	--	36	NA		**46.2**		NA		NA		24.6		4.6		4.5		6.8		7.1		35		**36.5**	
SVOCs	bis(2-Ethylhexyl) phthalate	µg/L	6.0	4.8	NA		***5.0***	U	NA		NA		***5.0***	U	NA		NA		NA		NA		0.52		***5.0***	U
	Naphthalene	µg/L	--	6.2	NA		0.10	U	NA		NA		0.10	U	NA		NA		NA		NA		5.0	U	0.10	U
VOCs	1,2-Dibromoethane	µg/L	0.05	0.0056	NA		***0.050***	U	NA		NA		***0.050***	U	NA		NA		NA		NA		***0.050***	U	***0.050***	U
	Bromodichloromethane	µg/L	--	0.18	NA		**0.25**	J	NA		NA		***0.50***	U	NA		NA		NA		NA		**0.46**	J	**0.51**	
	Chlorodibromomethane	µg/L	--	0.13	NA		***0.50***	U	NA		NA		***0.50***	U	NA		NA		NA		NA		***0.50***	U	***0.50***	U
	Chloroform	µg/L	--	0.17	NA		**2.9**		NA		NA		***0.50***	U	NA		NA		NA		NA		***2.3***	UJ	**2.4**	
	Tetrachloroethene	µg/L	5.0	0.10	NA		***0.50***	U	NA		NA		***0.50***	U	NA		NA		NA		NA		**0.39**	J	**0.36**	J
	Trichloroethene	µg/L	5.0	0.028	NA		***0.50***	U	NA		NA		***0.50***	U	NA		NA		NA		NA		***0.50***	U	**0.13**	J
General	Chloride	mg/L	250 [5]	--	NA		**410**		NA		NA		89		94		92		130		130		**290**		**280**	
	Fluoride	mg/L	4.0	2.2	NA		0.4		NA		NA		**5.6**		2.1		2.1		1.7		1.7		0.13		0.24	
	Sulfate	mg/L	250 [5]	--	NA		**900**		NA		NA		**830**		190		190		240		240		**630**		**640**	
	Total Dissolved Solids	mg/L	500 [5]	--	NA		**2,300**		NA		NA		**1,500**		**680**		**660**		**830**		**830**		**1,500**		**1,500**	
Radionuclides	Gross Alpha Activity	pCi/L	15	--	NA		6.6		5.1		NA		2.2		3.5		3.7		5.1		6.6		2.4		2.2	
	Radium 226 Activity	pCi/L	--	0.000823	NA		**0.4**		***0.4***	U	NA		***0.5***	U	***0.4***	U	***0.3***	U	***0.5***	U	**0.3**		***0.4***	U	***0.4***	U
	Uranium 234 Activity	pCi/L	--	0.674	NA		NA		NA		NA		NA		**2.4**		**2.4**		NA		NA		**0.9**		NA	
	Uranium 238 Activity	pCi/L	--	0.744	NA		NA		NA		NA		NA		**1.8**		**0.8**		NA		NA		0.6		NA	

TABLE 4-27
Groundwater Sampling Laboratory Value Exceedances
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The data in this table are illustrated on figures 4-48, 4-49, 4-50, 4-51, 4-52, 4-53, and 4-54.

			Location:	EPA Maximum Contaminant Level[1]	EPA Region IX Preliminary Remediation Goal[2]	ARU-1				ARU-8				H-1				H-2A				H-3				H-4			
			Event:			Winter		Summer		Winter		Summer		Winter		Summer		Winter		Summer		Winter		Summer		Winter		Summer	
			Date:			3/2/06		8/29/06		3/2/06		8/29/06		2/28/06		9/13/06		2/28/06		9/13/06		2/28/06		8/29/06		2/28/06		8/29/06	
	Parameter	Units				Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual
Inorganics	Aluminum	µg/L		50 [5]	36,000	320		50	UJ	20		19.7	UJ	19	J	200	U	20	U	200	U	720		79.4	UJ	38		200	U
Inorganics	Antimony	µg/L		6.0	15	1	U	2	U	1	U	0.09	UJ	1	U	0.09	UJ	1	U	2	U	1	U	0.17	UJ	1	U	0.11	UJ
Inorganics	Arsenic	µg/L		10	0.045	0.67	J	0.89	J	13		10		6.5		4.7		4.9		3.8		2.9		1.9		16		6.4	
Inorganics	Cadmium	µg/L		5.0	18	1	U	1	U	1	U	1	U	1	U	0.28	UJ	1	U	0.27	J	1	U	0.06	J	1	U	0.03	J
Inorganics	Iron	µg/L		300 [5]	11,000	1,400		780		100	U	100	U	920		513		820		411		780		100	U	1,300		100	U
Inorganics	Manganese	µg/L		50 [5]	880	77		51.1		2.1		1.3		6,500		7,330		7,200		5,250		300		34.3		270		75.1	
Inorganics	Molybdenum	µg/L		--	180	1.1		2		36		41.9		18		25		16		9.8		2.5		9.2		2.9		26.5	
Inorganics	Selenium	µg/L		50	180	0.8	J	1.7	J	1.7		1.6	J	2	U	5.9		2	U	4.5	J	1.5	J	2.9	J	2	U	1.3	J
Inorganics	Uranium	µg/L		30	7.3	7.3		NA		7.1		NA		1.4		NA		1.6		NA		21		NA		8.5		NA	
Inorganics	Vanadium	µg/L		--	36	4	U	3.1		8.5		11.4		5.1		5.2		4	U	1.7	J	10		10.2		8		7.2	
Inorganics	Dissolved Aluminum	µg/L		50	36,000	20	U	200	U	20	U	200	U	20	U	27.2	UJ	20	U	20.8	UJ	20	U	200	U	20	U	200	U
Inorganics	Dissolved Antimony	µg/L		6.0	15	1	U	2	U	1	U	0.12	UJ	1	U	0.1	UJ	1	U	2	U	1	U	0.12	UJ	1	U	0.19	UJ
Inorganics	Dissolved Arsenic	µg/L		10	0.045	1.1		0.89	UJ	12		9.2		6.4		4.7		5.1		3.6		2.8		2.5		6.9		5.9	
Inorganics	Dissolved Cadmium	µg/L		5.0	18	1	U	1	U	1	U	1	U	1	U	0.2	UJ	1	U	0.09	J	1	U	0.07	J	1	U	1	U
Inorganics	Dissolved Iron	µg/L		300 [5]	11,000	66	J	160		100	U	100	U	950		487		840		374		100	U	100	U	100	U	100	U
Inorganics	Dissolved Manganese	µg/L		50 [5]	880	12		4		1.6	J	0.45	UJ	6,700		7,250		7,300		5,150		36		12.3		9.7		37.4	
Inorganics	Dissolved Molybdenum	µg/L		--	180	2		2.1		35		33.2		19		25.7		17		9.3		12		4.6		14		27.6	
Inorganics	Dissolved Selenium	µg/L		50	180	4.8		2.3	UJ	1.6		3.4	UJ	2	U	6.5		2	U	4.4	J	1.8	J	5.8	J	2	U	2.7	UJ
Inorganics	Dissolved Uranium	µg/L		30	7.3	0.55		NA		7.1		NA		1.4		NA		1.7		NA		21		NA		8.5		NA	
Inorganics	Dissolved Vanadium	µg/L		--	36	27		2.9		7.5		10		4.8		4.5		4	U	1.5	J	7.1		8.7		4.4		6.4	
SVOCs	bis(2-Ethylhexyl) phthalate	µg/L		6.0	4.8	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
SVOCs	Naphthalene	µg/L		--	6.2	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
VOCs	1,2-Dibromoethane	µg/L		0.05	0.0056	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
VOCs	Bromodichloromethane	µg/L		--	0.18	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
VOCs	Chlorodibromomethane	µg/L		--	0.13	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
VOCs	Chloroform	µg/L		--	0.17	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
VOCs	Tetrachloroethene	µg/L		5.0	0.10	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
VOCs	Trichloroethene	µg/L		5.0	0.028	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
General	Chloride	mg/L		250 [5]	--	16		15		84		85		270		510		230		200		450		390		220		260	
General	Fluoride	mg/L		4.0	2.2	0.42		0.39		3.3		3.2		0.99		0.8		1.2		0.93		5.6		6.1		2.5		2.7	
General	Sulfate	mg/L		250 [5]	--	14		13		360		370		1,600		2,000		1,300		1,200		1,100		920		230		210	
General	Total Dissolved Solids	mg/L		500 [5]	--	230		210		960		980		3,000		4,100		2,400		2,400		2,200		2,500		1,000		1,000	
Radionuclides	Gross Alpha Activity	pCi/L		15	--	7.1		5		5.4		7.8		2.2		3.5		1.7		4		21.7		16.3		8.8		6.2	
Radionuclides	Radium 226 Activity	pCi/L		--	0.000823	0.3	U	0.2	U	0.3	U	0.2	U	0.4	U	0.5	U	0.4	U	0.5	U	0.4	U	0.3	U	0.3	U	0.3	U
Radionuclides	Uranium 234 Activity	pCi/L		--	0.674	3.3		NA		2.8		NA		1.1		NA		1.4		NA		13.9		NA		4.8		NA	
Radionuclides	Uranium 238 Activity	pCi/L		--	0.744	3		NA		2.4		NA		0.8		NA		0.9		NA		5.3		NA		2.9		NA	

TABLE 4-27
Groundwater Sampling Laboratory Value Exceedances
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The data in this table are illustrated on figures 4-48, 4-49, 4-50, 4-51, 4-52, 4-53, and 4-54.

			Location:	EPA Maximum Contaminant Level[1]	EPA Region IX Preliminary Remediation Goal[2]	H-5				H-6				H-7		H-8				H-9							
			Event:			Winter		Summer		Winter		Summer		Summer		Winter		Summer		Winter		Winter (Duplicate)		Summer		Summer (Duplicate)	
			Date:			2/28/06		9/13/06		2/27/06		8/29/06		8/30/06		2/28/06		8/30/06		2/28/06		2/28/06		8/30/06		8/30/06	
	Parameter	Units				Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual
Inorganics	Aluminum	µg/L		50 [5]	36,000	20	U	23.7	UJ	20	U	***200***	U	**815**		**100**		**383**		NA		20	U	31.1	UJ	30.6	UJ
Inorganics	Antimony	µg/L		6.0	15	1	U	0.12	UJ	1.1		1.1	UJ	0.21	UJ	1	U	0.44	UJ	NA		1	U	0.09	UJ	0.08	UJ
Inorganics	Arsenic	µg/L		10	0.045	**7.4**		**4.9**		**7.1**		**7.9**		**231**		**7.5**		**7.6**		NA		**6.4**		**6.6**		**7.4**	
Inorganics	Cadmium	µg/L		5.0	18	1	U	0.04	UJ	1	U	1	U	1	U	1	U	0.08	J	NA		1	U	0.03	J	0.05	J
Inorganics	Iron	µg/L		300 [5]	11,000	140		**404**		100	U	100	U	**623**		210		145		NA		100	U	100	U	100	U
Inorganics	Manganese	µg/L		50 [5]	880	**850**		**2,190**		3.7		5.2		19.5		26		40.8		NA		**460**		**485**		**492**	
Inorganics	Molybdenum	µg/L		--	180	15		18.5		65		65.9		3.5		30		**300**		NA		76		85.7		87.6	
Inorganics	Selenium	µg/L		50	180	2	U	3.1	J	2	U	13.1		2.9	J	**100**		35		NA		**56**		46.6		47.2	
Inorganics	Uranium	µg/L		30	7.3	1.6		NA		3		NA		NA		5.2		NA		NA		**9.8**		NA		NA	
Inorganics	Vanadium	µg/L		--	36	4	U	0.75	UJ	3.8	J	9.8		**598**		**70**		**60.7**		NA		33		**48.1**		**47.8**	
Inorganics	Dissolved Aluminum	µg/L		50	36,000	20	U	31.2	UJ	20	U	***200***	U	40.3	J	20	U	***200***	U	20	U	NA		***200***	U	***200***	U
Inorganics	Dissolved Antimony	µg/L		6.0	15	1	U	2	U	0.97	J	1.2	UJ	0.22	UJ	1	U	0.5	UJ	1	U	NA		0.11	UJ	0.1	UJ
Inorganics	Dissolved Arsenic	µg/L		10	0.045	**6.7**		**4.8**		**7.2**		**6.8**		**199**		**7**		**6.2**		**6.5**		NA		**6.5**		**6.9**	
Inorganics	Dissolved Cadmium	µg/L		5.0	18	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	NA		1	U	0.04	J
Inorganics	Dissolved Iron	µg/L		300 [5]	11,000	110		**373**		100	U	100	U	100	U	100	U	100	U	100	U	NA		100	U	100	U
Inorganics	Dissolved Manganese	µg/L		50 [5]	880	**820**		**2,190**		1.6	J	3.7		1.1		7.6		9.5		**450**		NA		**344**		**353**	
Inorganics	Dissolved Molybdenum	µg/L		--	180	14		20.3		66		61.1		3.3		31		**259**		77		NA		75.1		77.5	
Inorganics	Dissolved Selenium	µg/L		50	180	2	U	4	J	2	U	13.6		4.2	UJ	**100**		31		**57**		NA		49.1		49.1	
Inorganics	Dissolved Uranium	µg/L		30	7.3	1.6		NA		2.9		NA		NA		5.3		NA		**9.7**		NA		NA		NA	
Inorganics	Dissolved Vanadium	µg/L		--	36	4	U	0.71	UJ	3.5	J	8.1		**505**		**85**		**45**		**42**		NA		35.7		35.7	
SVOCs	bis(2-Ethylhexyl) phthalate	µg/L		6.0	4.8	NA		NA		NA		NA		NA		NA		NA		***5.0***	U	NA		***5.0***	U	***5.0***	U
SVOCs	Naphthalene	µg/L		--	6.2	NA		NA		NA		NA		NA		NA		NA		0.10	UJ	NA		0.10	U	0.10	U
VOCs	1,2-Dibromoethane	µg/L		0.05	0.0056	NA		NA		NA		NA		NA		NA		NA		***0.050***	U	NA		***0.050***	U	***0.050***	U
VOCs	Bromodichloromethane	µg/L		--	0.18	NA		NA		NA		NA		NA		NA		NA		***0.50***	U	NA		***0.50***	U	***0.50***	U
VOCs	Chlorodibromomethane	µg/L		--	0.13	NA		NA		NA		NA		NA		NA		NA		***0.50***	U	NA		***0.50***	U	***0.50***	U
VOCs	Chloroform	µg/L		--	0.17	NA		NA		NA		NA		NA		NA		NA		***0.50***	U	NA		***0.50***	U	***0.50***	U
VOCs	Tetrachloroethene	µg/L		5.0	0.10	NA		NA		NA		NA		NA		NA		NA		***0.50***	U	NA		***0.50***	U	***0.50***	U
VOCs	Trichloroethene	µg/L		5.0	0.028	NA		NA		NA		NA		NA		NA		NA		***0.50***	U	NA		***0.50***	U	***0.50***	U
General	Chloride	mg/L		250 [5]	--	190		**400**		160		170		25		**280**		40		**500**		**510**		**510**		**490**	
General	Fluoride	mg/L		4.0	2.2	1.4		0.91		1.2		1.4		0.66		0.38		0.91		0.69		0.66		0.61		0.63	
General	Sulfate	mg/L		250 [5]	--	110		**500**		100		160		43		**1,100**		**630**		**1,700**		**1,700**		**1,800**		**1,800**	
General	Total Dissolved Solids	mg/L		500 [5]	--	**730**		**1,700**		**600**		**740**		**600**		**2,400**		**1,200**		**3,600**		**3,700**		**3,700**		**3,800**	
Radionuclides	Gross Alpha Activity	pCi/L		15	--	2.1		6.7		3.4		2.6		**16.4**		5		3.9		9.4		8.8		9.8		11.2	
Radionuclides	Radium 226 Activity	pCi/L		--	0.000823	***0.3***	U	***0.6***	U	**0.8**		***0.3***	U	***0.3***	U	***0.4***	U	***0.3***	U	***0.4***	U	***0.3***	U	***0.3***	U	***0.3***	U
Radionuclides	Uranium 234 Activity	pCi/L		--	0.674	0.6		NA		**2.1**		NA		NA		**2.6**		NA		**5.5**		**6.3**		NA		NA	
Radionuclides	Uranium 238 Activity	pCi/L		--	0.744	0.5		NA		**1**		NA		NA		**1.3**		NA		**3.6**		**2.6**		NA		NA	

TABLE 4-27
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The data in this table are illustrated on figures 4-48, 4-49, 4-50, 4-51, 4-52, 4-53, and 4-54.

			Location:	EPA Maximum Contaminant Level[1]	EPA Region IX Preliminary Remediation Goal[2]	H-10				H-11				LC-1				MW-2				MW-4				S-4A			
			Event:			Winter		Summer		Winter		Summer		Winter		Summer		Winter		Summer		Winter		Summer		Winter		Summer	
			Date:			2/27/06		8/29/06		2/28/06		9/13/06		2/28/06		8/30/06		3/2/06		8/30/06		3/2/06		8/30/06		2/28/06		8/29/06	
	Parameter	Units				Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual
Inorganics	Aluminum	µg/L		50 [5]	36,000	20	U	***200***	U	10	J	***200***	U	**1,300**		**3,070**		NA		24.9	UJ	20	U	***200***	U	20	U	***200***	U
	Antimony	µg/L		6.0	15	1	U	0.06	UJ	1	U	0.1	UJ	1	U	2	U	NA		2	U	1	U	2	U	1	U	0.09	UJ
	Arsenic	µg/L		10	0.045	**5.2**		**5.8**		**6.2**		**6.5**		**8**		**21.9**		NA		**1.7**		**4.6**		**5.8**		**4.9**		**3.8**	
	Cadmium	µg/L		5.0	18	1	U	1	U	1	U	0.09	UJ	2.2		2.1		NA		1	U	1	U	1	U	1	U	1	U
	Iron	µg/L		300 [5]	11,000	100	U	100	U	100	U	100	U	**910**		**4,130**		NA		**3,130**		**1,800**		**2,810**		100	U	100	U
	Manganese	µg/L		50 [5]	880	**320**		**767**		28		2		**80**		**74.9**		NA		31.3		40		43.2		2	U	1	U
	Molybdenum	µg/L		--	180	0.58		3		43		41.3		**510**		**517**		NA		2.8		1.1		1.2		16		17.4	
	Selenium	µg/L		50	180	4.4		6		11		15.2		**480**		**781**		NA		5.7		**55**		**58.4**		2.2		1.1	J
	Uranium	µg/L		30	7.3	2.5		NA		3.6		NA		0.58		NA		NA		NA		1.1		NA		3.8		NA	
	Vanadium	µg/L		--	36	2	J	5.4		19		24.7		**48**		**53.4**		NA		**56**		**49**		**63.4**		4		8.4	
	Dissolved Aluminum	µg/L		50	36,000	20	U	***200***	U	20	U	***200***	U	**66**		***200***	U	14	J	***200***	U	20	U	***200***	U	20	U	***200***	U
	Dissolved Antimony	µg/L		6.0	15	1	U	0.11	UJ	1	U	0.12	UJ	1	U	0.07	UJ	1	U	2	U	1	U	2	U	1	U	0.11	UJ
	Dissolved Arsenic	µg/L		10	0.045	**5**		**5.3**		**6.1**		**5.5**		**7.6**		**5**		**0.79**	J	**1.7**		**4**		**4.9**		**4.5**		**3.5**	
	Dissolved Cadmium	µg/L		5.0	18	1	U	0.03	J	1	U	0.06	UJ	1	U	1	U	1	U	0.04	J	1	U	0.08	J	1	U	1	U
	Dissolved Iron	µg/L		300 [5]	11,000	100	U	100	U	100	U	100	U	100		100	U	100	U	100	U	100	U	100	U	100	U	100	U
	Dissolved Manganese	µg/L		50 [5]	880	**68**		**154**		25		0.46	UJ	8.2		6.6		2	U	11.2		5		4.7		3.9		0.08	UJ
	Dissolved Molybdenum	µg/L		--	180	5.3		5.5		42		39.9		**540**		**533**		2.1		2.7		15		1.1		16		14.5	
	Dissolved Selenium	µg/L		50	180	4		7.8		11		13.7		**500**		**677**		1.1		8		0.77	J	**58.2**		2.5		2.1	UJ
	Dissolved Uranium	µg/L		30	7.3	2.3		NA		3.7		NA		0.48	J	NA		6.7		NA		3.7		NA		3.8		NA	
	Dissolved Vanadium	µg/L		--	36	4	U	4.4		18		23.5		**51**		**40.5**		4	U	28.8		4.1		**41.2**		4.7		6.8	
SVOCs	bis(2-Ethylhexyl) phthalate	µg/L		6.0	4.8	NA		NA		0.85	J	***5.0***	U	NA		NA		NA		NA		**28**		**8.7**		0.26	J	***5.0***	U
	Naphthalene	µg/L		--	6.2	NA		NA		0.10	U	0.10	U	NA		NA		NA		NA		0.071	J	0.10	U	0.10	U	0.10	U
VOCs	1,2-Dibromoethane	µg/L		0.05	0.0056	NA		NA		***0.050***	U	**0.052**		NA		NA		NA		NA		***0.050***	U	***0.050***	U	***0.050***	U	***0.050***	U
	Bromodichloromethane	µg/L		--	0.18	NA		NA		***0.50***	U	***0.50***	U	NA		NA		NA		NA		***0.50***	U	***0.50***	U	***0.50***	U	***0.50***	U
	Chlorodibromomethane	µg/L		--	0.13	NA		NA		***0.50***	U	***0.50***	U	NA		NA		NA		NA		***0.50***	U	***0.50***	U	***0.50***	U	***0.50***	U
	Chloroform	µg/L		--	0.17	NA		NA		***0.50***	U	***0.50***	U	NA		NA		NA		NA		***0.50***	U	***0.50***	U	***0.50***	U	***0.50***	U
	Tetrachloroethene	µg/L		5.0	0.10	NA		NA		***0.50***	U	***0.50***	U	NA		NA		NA		NA		***0.50***	U	***0.50***	U	***0.50***	U	***0.50***	U
	Trichloroethene	µg/L		5.0	0.028	NA		NA		***0.50***	U	***0.50***	U	NA		NA		NA		NA		***0.50***	U	***0.50***	U	***0.50***	U	***0.50***	U
General	Chloride	mg/L		250 [5]	--	**280**		220		**310**		**290**		54		72		NA		**340**		NA		180		NA		30	
	Fluoride	mg/L		4.0	2.2	0.76		0.76		1.4		1.4		0.45		0.41		NA		0.23		NA		0.2		NA		1.8	
	Sulfate	mg/L		250 [5]	--	230		200		**620**		**530**		**1,400**		**1,300**		NA		**710**		NA		**900**		NA		220	
	Total Dissolved Solids	mg/L		500 [5]	--	**1,100**		**930**		**1,700**		**1,600**		**2,500**		**2,600**		NA		**1,700**		NA		**1,700**		NA		**650**	
Radionuclides	Gross Alpha Activity	pCi/L		15	--	2.8		3.5		4.2		4.5		5.9		4		2.5		1.5		1.7		2		4		3.9	
	Radium 226 Activity	pCi/L		--	0.000823	***0.4***	U	***0.3***	U	***0.3***	U	***0.5***	U	***0.4***	U	***0.3***	U	***0.3***	U	***0.3***	U	***0.5***	U	***0.2***	U	***0.5***	U	***0.2***	U
	Uranium 234 Activity	pCi/L		--	0.674	**1.8**		NA		**2.7**		NA		0.6		NA		0.3	U	NA		**0.8**		NA		**2.7**		NA	
	Uranium 238 Activity	pCi/L		--	0.744	0.6		NA		**1.5**		NA		0.5		NA		0.5	U	NA		0.5		NA		**1.4**		NA	

TABLE 4-27
Groundwater Sampling Laboratory Value Exceedances
Monitoring Wells, Water Supply Wells and Drinking Fountains
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The data in this table are illustrated on figures 4-48, 4-49, 4-50, 4-51, 4-52, 4-53, and 4-54.

			Location:	EPA Maximum Contaminant Level[1]	EPA Region IX Preliminary Remediation Goal[2]	SM-2		Hayden Library				HWF-15				HWF-21								HWF-26			
			Event:			Summer		Winter		Summer		Winter		Summer		Winter		Winter (Duplicate)		Summer		Summer (Duplicate)		Winter		Summer	
			Date:			9/1/06		3/2/06		8/29/06		3/2/06		8/31/06		3/2/06		3/2/06		8/31/06		8/31/06		3/2/06		9/13/06	
	Parameter	Units				Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual
Inorganics	Aluminum	µg/L		50 [5]	36,000	**909**	J	16	J	***200***	U	20	U	***200***	UJ	20	U	20	U	***200***	UJ	***200***	UJ	20	U	***200***	U
Inorganics	Antimony	µg/L		6.0	15	0.86	UJ	1	U	0.16	UJ	1	U	0.14	UJ	1	U	1	U	0.28	UJ	0.27	UJ	1	U	0.39	UJ
Inorganics	Arsenic	µg/L		10	0.045	**43.7**		**4.5**		**3.8**		**3.9**		**3.6**		**4.1**		**4.2**		**3.8**		**3.8**		**3.5**		**3.2**	
Inorganics	Cadmium	µg/L		5.0	18	0.93	UJ	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Inorganics	Iron	µg/L		300 [5]	11,000	**1,780**	J	100	U	100	U	100	U	100	UJ	100	U	100	U	100	UJ	100	UJ	100	U	100	U
Inorganics	Manganese	µg/L		50 [5]	880	**55.6**		3		2.5		2	U	0.78	UJ	3.1		3.5		2.8		3		8.1		5.2	
Inorganics	Molybdenum	µg/L		--	180	**426**		35		33.3		51		73.8		6.6		6.6		6.5		6.8		47		52.5	
Inorganics	Selenium	µg/L		50	180	**56.1**		5		3.1	J	7.2		4.3	J	1.6		2.1		2.7	J	2.4	J	6		7.3	
Inorganics	Uranium	µg/L		30	7.3	NA		4.5		NA		4		NA		**8.1**		**8.2**		NA		NA		5.7		NA	
Inorganics	Vanadium	µg/L		--	36	16.6		5.5		8.6		6		9.9		3.3	J	3.3	J	7.5		7.6		4.7		7.7	
Inorganics	Dissolved Aluminum	µg/L		50	36,000	***200***	U	20	U	***200***	U	20	U	***200***	U	20	U	20	U	***200***	U	***200***	U	20	U	***200***	U
Inorganics	Dissolved Antimony	µg/L		6.0	15	0.38	UJ	1	U	0.19	UJ	1	U	0.13	UJ	1	U	1	U	0.22	UJ	0.23	UJ	1	U	0.37	UJ
Inorganics	Dissolved Arsenic	µg/L		10	0.045	**12.9**		**4.2**		**3.5**		**3.9**		**3.4**		**4**		**3.9**		**3.5**		**3.4**		**3.1**		**2.8**	
Inorganics	Dissolved Cadmium	µg/L		5.0	18	0.71	J	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U
Inorganics	Dissolved Iron	µg/L		300 [5]	11,000	100	UJ	100	U	100	U	100	U	100	UJ	100	U	100	U	100	UJ	100	UJ	100	U	100	U
Inorganics	Dissolved Manganese	µg/L		50 [5]	880	11.4		2.3		0.86	UJ	2	U	0.92	J	3.2		3.3		2.8		3.3		7.2		4.6	
Inorganics	Dissolved Molybdenum	µg/L		--	180	**394**		34		29.2		50		70.3		6.3		6.3		6.5		6.1		45		53.4	
Inorganics	Dissolved Selenium	µg/L		50	180	**52.8**		4.9		4	UJ	7.1		4.2	J	1.7		1.8		2.2	J	2.2	J	5.5		6.4	
Inorganics	Dissolved Uranium	µg/L		30	7.3	NA		5.1		NA		4.8		NA		**9**		**8.6**		NA		NA		7		NA	
Inorganics	Dissolved Vanadium	µg/L		--	36	11		5		6.9		5.6		9.8		3.1	J	3.2	J	7.1		7		4.4		7.2	
SVOCs	bis(2-Ethylhexyl) phthalate	µg/L		6.0	4.8	NA		NA		NA		NA		***5.0***	U	NA		NA		NA		NA		***5.0***	UJ	***5.0***	U
SVOCs	Naphthalene	µg/L		--	6.2	NA		NA		NA		NA		0.10	U	NA		NA		NA		NA		5.0	UJ	0.10	U
VOCs	1,2-Dibromoethane	µg/L		0.05	0.0056	NA		NA		NA		***0.050***	U	***0.050***	U	NA		NA		NA		NA		***0.050***	U	***0.050***	U
VOCs	Bromodichloromethane	µg/L		--	0.18	NA		NA		NA		***0.50***	U	***0.50***	U	NA		NA		NA		NA		***0.50***	U	***0.50***	U
VOCs	Chlorodibromomethane	µg/L		--	0.13	NA		NA		NA		***0.50***	U	***0.50***	U	NA		NA		NA		NA		***0.50***	U	***0.50***	U
VOCs	Chloroform	µg/L		--	0.17	NA		NA		NA		***0.50***	U	***0.50***	U	NA		NA		NA		NA		***0.50***	U	***0.50***	U
VOCs	Tetrachloroethene	µg/L		5.0	0.10	NA		NA		NA		***0.50***	U	***0.50***	U	NA		NA		NA		NA		***0.50***	U	***0.50***	U
VOCs	Trichloroethene	µg/L		5.0	0.028	NA		NA		NA		***0.50***	U	***0.50***	U	NA		NA		NA		NA		***0.50***	U	***0.50***	U
General	Chloride	mg/L		250 [5]	--	**590**		170		NA		220		210		86		85		110		110		240		220	
General	Fluoride	mg/L		4.0	2.2	0.15	J	1.6		NA		1.7		1.9		1.6		1.6		1.6		1.6		2		2	
General	Sulfate	mg/L		250 [5]	--	**1,200**		**260**		NA		**290**		240		240		**250**		**330**		**330**		**490**		**320**	
General	Total Dissolved Solids	mg/L		500 [5]	--	**3,000**		**930**		**900**		**1,100**		**960**		**780**		**780**		**980**		**980**		**1,400**		**1,100**	
Radionuclides	Gross Alpha Activity	pCi/L		15	--	**21.3**		4.8		4.9		4.1		5		8		7.1		8		7.6		5.5		6	
Radionuclides	Radium 226 Activity	pCi/L		--	0.000823	***0.7***	U	***0.3***	U	***0.2***	U	***0.4***	U	***0.4***	U	**0.5**		***0.3***	U	***0.3***	U	***0.2***	U	***0.5***	U	***0.6***	U
Radionuclides	Uranium 234 Activity	pCi/L		--	0.674	NA		**1.6**		NA		**2.4**		NA		**4.5**		**2.9**		NA		NA		**3.3**		NA	
Radionuclides	Uranium 238 Activity	pCi/L		--	0.744	NA		**0.9**		NA		**1**		NA		**2.2**		**1.5**		NA		NA		**2.1**		NA	

TABLE 4-27
Groundwater Sampling Laboratory Value Exceedances
Monitoring Wells, Water Supply Wells and Drinking Fountains
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The data in this table are illustrated on figures 4-48, 4-49, 4-50, 4-51, 4-52, 4-53, and 4-54.

	Location:		EPA Maximum Contaminant Level[1]	EPA Region IX Preliminary Remediation Goal[2]	Hayden Wellfield Manifold				WM-3				WM-4				Winkelman Elementary School				Winkelman Wellfield Manifold				Equipment Blank	
	Event:				Winter		Summer		Winter		Summer		Winter		Summer		Winter		Summer		Winter		Summer		Winter	
	Date:				3/2/06		8/31/06		3/3/06		8/31/06		3/3/06		9/12/06		3/2/06		9/1/06		3/3/06		9/12/06		2/23/06	
	Parameter	Units			Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual
Inorganics	Aluminum	µg/L	50 [5]	36,000	20	U	***200***	UJ	20	U	***200***	UJ	20	U	***200***	U	20	U	***200***	U	20	U	27.1	UJ	***200***	U
	Antimony	µg/L	6.0	15	1	U	0.13	UJ	1	U	0.16	UJ	1	U	0.2	UJ	1	U	0.14	UJ	1	U	0.19	UJ	***60***	U
	Arsenic	µg/L	10	0.045	**4.2**		**3.6**		**5**		**3.8**		**4.4**		**3.6**		**4.8**		**3.9**		**4.5**		**3.8**		***10***	U
	Cadmium	µg/L	5.0	18	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	1	U	***5***	U
	Iron	µg/L	300 [5]	11,000	100	U	100	UJ	100		100	UJ	100	U	178		100	U	100	U	100	U	148		100	U
	Manganese	µg/L	50 [5]	880	1.2	J	0.77	UJ	14		7.4		**100**		**278**		**110**		4.8		**51**		**177**		15	U
	Molybdenum	µg/L	--	180	33		70.5		9		10.2		16		29		11		11.4		12		19.3		NA	
	Selenium	µg/L	50	180	4.5		4	J	0.81	J	1.5	J	0.97	J	1.4	J	0.73	J	1	J	0.7	J	1.4	J	35	U
	Uranium	µg/L	30	7.3	4.6		NA		3.3		NA		3.9		NA		3.6		NA		3.5		NA		NA	
	Vanadium	µg/L	--	36	4.9		9.9		5.1		8.5		4.9		6.3		5		8.6		4.7		7.5		***50***	U
	Dissolved Aluminum	µg/L	50	36,000	20	U	***200***	U	NA		***200***	U	20	U	25.8	UJ	20	U	***200***	U	20	U	***200***	U	NA	
	Dissolved Antimony	µg/L	6.0	15	1	U	0.12	UJ	NA		0.14	UJ	1	U	0.16	UJ	1	U	0.16	UJ	1	U	0.16	UJ	NA	
	Dissolved Arsenic	µg/L	10	0.045	**4.2**		**3.6**		NA		**3.3**		**4.5**		**2.1**		**4.4**		**3.4**		**3**		**2.7**		NA	
	Dissolved Cadmium	µg/L	5.0	18	1	U	1	U	NA		1	U	1	U	1	U	1	U	1	U	1	U	0.02	UJ	NA	
	Dissolved Iron	µg/L	300 [5]	11,000	100	U	100	UJ	NA		100	UJ	53	J	100	U	100	U	100	U	100	U	100	U	NA	
	Dissolved Manganese	µg/L	50 [5]	880	1.5	J	0.8	J	NA		5.2		**140**		**75.1**		4.4		1.2		17		38.4		NA	
	Dissolved Molybdenum	µg/L	--	180	33		73		NA		10.2		12		23.1		9.2		10.6		1.4		16.1		NA	
	Dissolved Selenium	µg/L	50	180	4.6		3.9	J	NA		0.93	J	0.69	J	0.96	J	0.53	J	1.7	UJ	**54**		0.96	J	NA	
	Dissolved Uranium	µg/L	30	7.3	4.3		NA		NA		NA		3.3		NA		3.1		NA		1		NA		NA	
	Dissolved Vanadium	µg/L	--	36	5.2		10		NA		8.1		5.2		4.9		5.3		7		32		5.8		NA	
SVOCs	bis(2-Ethylhexyl) phthalate	µg/L	6.0	4.8	NA		***5.0***	U	NA		NA		NA		NA		NA		NA		0.44		1.9	J	NA	
	Naphthalene	µg/L	--	6.2	NA		0.10	U	NA		NA		NA		NA		NA		NA		5.0	U	0.10	U	NA	
VOCs	1,2-Dibromoethane	µg/L	0.05	0.0056	***0.050***	U	***0.050***	U	NA		NA		NA		NA		NA		NA		***0.050***	U	**0.036**	J	NA	
	Bromodichloromethane	µg/L	--	0.18	***0.50***	U	***0.50***	U	NA		NA		NA		NA		NA		NA		**2.5**		**1.7**		NA	
	Chlorodibromomethane	µg/L	--	0.13	***0.50***	U	***0.50***	U	NA		NA		NA		NA		NA		NA		**2.4**		**1.2**		NA	
	Chloroform	µg/L	--	0.17	***0.50***	U	***0.50***	U	NA		NA		NA		NA		NA		NA		***1.2***	UJ	***0.50***	U	NA	
	Tetrachloroethene	µg/L	5.0	0.10	***0.50***	U	***0.50***	U	NA		NA		NA		NA		NA		NA		***0.50***	UJ	R		NA	
	Trichloroethene	µg/L	5.0	0.028	***0.50***	U	***0.50***	U	NA		NA		NA		NA		NA		NA		***0.50***	UJ	R		NA	
General	Chloride	mg/L	250 [5]	--	160		NA		180		220		240		**280**		210		NA		240		**270**		NA	
	Fluoride	mg/L	4.0	2.2	1.5		NA		1.2		1.1		1.3		1.4		1.2		NA		1.2		1.2		NA	
	Sulfate	mg/L	250 [5]	--	**260**		NA		93		110		140		190		130		NA		140		160		NA	
	Total Dissolved Solids	mg/L	500 [5]	--	**900**		**950**		**640**		**740**		**830**		**840**		**760**		**750**		**760**		**840**		NA	
Radionuclides	Gross Alpha Activity	pCi/L	15	--	4.7		3.9		2.6		3.8		3.2		3.7		3.1		3.7		3.5		4.4		NA	
	Radium 226 Activity	pCi/L	--	0.000823	***0.4***	U	***0.3***	U	***0.6***	U	***0.3***	U	***0.5***	U	***0.5***	U	***0.5***	U	***0.3***	U	***0.6***	U	***0.2***	U	NA	
	Uranium 234 Activity	pCi/L	--	0.674	**2.7**		NA		**2**		NA		**2.3**		NA		**2.2**		NA		**2.7**		NA		NA	
	Uranium 238 Activity	pCi/L	--	0.744	**1.5**		NA		**0.8**		NA		**0.9**		NA		**0.8**		NA		**0.8**		NA		NA	

TABLE 4-27
Groundwater Sampling Laboratory Value Exceedances
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The data in this table are illustrated on figures 4-48, 4-49, 4-50, 4-51, 4-52, 4-53, and 4-54.

			Location:	EPA Maximum Contaminant Level[1]	EPA Region IX Preliminary Remediation Goal[2]	Equipment Blank		Equipment Blank (ASARCO)[3]		Equipment Blank (CH2M HILL)[4]	
			Event:			Winter		Summer		Summer	
			Date:			3/6/06		8/29/06		9/1/06	
	Parameter	Units				Result	Qual	Result	Qual	Result	Qual
Inorganics	Aluminum	µg/L		50 [5]	36,000	20	U	44.8	UJ	***200***	UJ
	Antimony	µg/L		6.0	15	1	U	0.07	UJ	2	U
	Arsenic	µg/L		10	0.045	***1***	U	**0.31**	J	***1***	U
	Cadmium	µg/L		5.0	18	1	U	0.02	J	0.02	UJ
	Iron	µg/L		300 [5]	11,000	100	U	100	U	19.2	J
	Manganese	µg/L		50 [5]	880	2	U	3.6		0.49	UJ
	Molybdenum	µg/L		--	180	0.26	J	0.16		0.79	
	Selenium	µg/L		50	180	1	U	5	U	5	U
	Uranium	µg/L		30	7.3	0.5	U	NA		NA	
	Vanadium	µg/L		--	36	4	U	0.57	UJ	0.13	UJ
	Dissolved Aluminum	µg/L		50	36,000	20	U	***200***	U	***200***	U
	Dissolved Antimony	µg/L		6.0	15	1	U	2	U	2	U
	Dissolved Arsenic	µg/L		10	0.045	***1***	U	***0.26***	UJ	***1***	U
	Dissolved Cadmium	µg/L		5.0	18	1	U	1	U	1	U
	Dissolved Iron	µg/L		300 [5]	11,000	100	U	100	U	100	UJ
	Dissolved Manganese	µg/L		50 [5]	880	2	U	1	U	0.25	J
	Dissolved Molybdenum	µg/L		--	180	0.3	J	0.1		0.32	
	Dissolved Selenium	µg/L		50	180	1	U	0.31	UJ	5	U
	Dissolved Uranium	µg/L		30	7.3	0.5	U	NA		NA	
	Dissolved Vanadium	µg/L		--	36	4	U	0.55	UJ	0.09	UJ
SVOCs	bis(2-Ethylhexyl) phthalate	µg/L		6.0	4.8	***5.0***	U	***5.0***	U	***5.0***	U
	Naphthalene	µg/L		--	6.2	5.0	U	**6.8**	J	0.10	U
VOCs	1,2-Dibromoethane	µg/L		0.05	0.0056	***0.050***	U	***0.050***	U	***0.050***	U
	Bromodichloromethane	µg/L		--	0.18	***0.50***	U	***0.50***	U	0.15	J
	Chlorodibromomethane	µg/L		--	0.13	***0.50***	U	***0.50***	U	**0.19**	J
	Chloroform	µg/L		--	0.17	**0.70**		***0.50***	U	**0.89**	
	Tetrachloroethene	µg/L		5.0	0.10	***0.50***	U	***0.50***	U	***0.50***	U
	Trichloroethene	µg/L		5.0	0.028	***0.50***	U	***0.50***	U	***0.50***	U
General	Chloride	mg/L		250 [5]	--	2.7		1	U	1	U
	Fluoride	mg/L		4.0	2.2	0.1	U	0.1	U	0.1	U
	Sulfate	mg/L		250 [5]	--	0.5	U	0.5	U	0.5	U
	Total Dissolved Solids	mg/L		500 [5]	--	20	U	20	U	12	J
Radionuclides	Gross Alpha Activity	pCi/L		15	--	0.4	U	0.4		1.2	
	Radium 226 Activity	pCi/L		--	0.000823	***0.3***	U	***0.3***	U	***0.5***	U
	Uranium 234 Activity	pCi/L		--	0.674	0.3	U	NA		NA	
	Uranium 238 Activity	pCi/L		--	0.744	0.5	U	NA		NA	

Table Notes:

[1] EPA Maximum Contaminant Level, EPA 816-F-03-016, June 2003
[2] EPA Region IX Preliminary Remediation Goals, Tap Water, October 2004
[3] Equipment blank taken from ASARCO sampling equipment.
[4] Equipment blank taken from CH2M HILL sampling equipment.
[5] Secondary MCL
[6] Bold values with bold outline exceed one or more of the comparison criteria.
[7] Bold italicized values have detection limits above one or more of the comparison criteria.
[8] -- = Not established
[9] J = Estimated value
[10] mg/L = milligrams per Liter
[11] NA = Not analyzed
[12] pCi/L = Picocuries per Liter
[13] µg/L = micrograms per Liter
[14] U = Not detected; reporting limit is shown in place of a result.
[15] UJ = Not detected; reporting limit is approximate and is shown in place of a result.

TABLE 4-28
Groundwater Elevation Data
Remedial Investigation Report
ASARCO LLC Hayden, Arizona Plant Site

The data in this table are illustrated on figures 2-4 and 2-5.

Well ID	Well Head Elevation[1]	Depth to Water (ft)		Groundwater Elevation (ft above msl)	
		Winter	Summer/Fall	Winter	Summer/Fall
		2/7/2006	10/19/2006	2/7/2006	10/19/2006
ARU-1	1,980.80	16.53	16.44	1,964.27	1,964.36
ARU-5	1,930.70	41.12	41.74	1,889.58	1,888.96
ARU-8	1,919.40	21.79	22.01	1,897.61	1,897.39
ARU-10	2,329.40	OBS	337.95	OBS	1,991.45
ARU-12	1,995.20	115.51	114.73	1,879.69	1,880.47
H-1	1,886.90	17.78	16.92	1,869.12	1,869.98
H-2A	1,887.00	18.80	18.20	1,868.20	1,868.80
H-3	1,922.30	41.35	39.17	1,880.95	1,883.13
H-4	1,912.10	24.71	24.33	1,887.39	1,887.77
H-5	1,900.00	17.54	16.55	1,882.46	1,883.45
H-6	1,939.90	21.51	21.13	1,918.39	1,918.77
H-7	2,176.60	97.86	95.35	2,078.74	2,081.25
H-8	1,966.80	52.92	52.22	1,913.88	1,914.58
H-9	1,967.00	37.76	34.12	1,929.24	1,932.88
H-10	1,941.80	19.47	18.74	1,922.33	1,923.06
H-11	1,919.50	32.27	31.15	1,887.23	1,888.35
LC-1	2,103.00	52.72	41.13	2,050.28	2,061.87
MW-2	2,010.00 [2]	32.78	31.22	1,977.22	1,978.78
MW-4	2,130.00 [2]	96.98	96.42	2,033.02	2,033.58
SM-2	2,147.40	87.14	82.02	2,060.26	2,065.38
GW-01	2,016.65	53.09	NM	1,963.56	NM
GW-01(R)	2,016.82	NA	55.71	NA	1,961.11
GW-02	1,948.24	19.49	13.84	1,928.75	1,934.40
GW-03	1,926.56	39.57	39.03	1,886.99	1,887.53
GW-06	2,003.60	8.26	9.05	1,995.34	1,994.55
77 Bridge	1,944.95	NA	33.91	NA	1,911.04
RR Bridge	1,931.68	NA	30.14	NA	1,901.54

Table Notes:

[1] Well head elevations are measured from top of casing.

[2] The well head elevations for MW-2 and MW-4 are estimates based on surface elevation

[3] ft = Feet

[4] MSL = Mean sea level

[5] NA = Not available

[6] NM = GW-01 was replaced by GW-01(R), therefore GW-01 was not measured during the summer

[7] OBS = Obstruction

TABLE 4-29

Background Concentrations of Metals in Ambient Air - PM_{10} Samples

Organ Pipe National Monument

Remedial Investigation Report

ASARCO LLC Hayden, Arizona Plant Site

Air Contaminant	Units	EPA Region IX Preliminary Remediation Goal[1]	Arithmetic Mean	Minimum Detected Value	Maximum Detected Value
PM_{10}	$\mu g/m^3$	--	16	6.58	71.9
Arsenic	$\mu g/m^3$	0.00045	ND[5]	ND[5]	ND[5]
Cadmium	$\mu g/m^3$	0.0011	ND[5]	ND[5]	ND[5]
Chromium	$\mu g/m^3$	0.00016	**0.000493**	**0.0003**	**0.0017**
Copper	$\mu g/m^3$	--	0.00142	0.0005	0.0043
Lead	$\mu g/m^3$	--	0.00133	0.0008	0.0027

Table Notes:

[1] EPA Region IX Preliminary Remediation Goals, Ambient Air, October 2004

[2] The data is based on analysis of 15 PM_{10} filter samples collected at a 24-day interval from January 2, 2006 to December 4, 2006 at Organ Pipe National Monument.

[3] Bold values with bold outline indicate the value exceeds the comparison criteria.

[4] -- = Not established

[5] ND = Not detected; the range of detection is 0.0003 to 0.0006 $\mu g/m^3$ for arsenic and 0.0006 to 0.0009 $\mu g/m^3$ for cadmium.

[6] PM_{10} = Particulate matter with a diameter less than or equal to 10 microns in size

[7] $\mu g/m^3$ = Micrograms per cubic meter

TABLE 4-30
Summary of Meteorological Data
Hayden and Winkelman Monitoring Stations
Remedial Investigation Report
ASARCO LLC Hayden, Arizona Plant Site

		Month/Year:	September 2006			October 2006			November 2006			December 2006			January 2007			February 2007			March 2007			April 2007			May 2007			June 2007		
Monitoring Station	**Parameter**	**Units**	**Min**	**Max**	**Avg**	**Min**	**Max**	**Avg**	**Min**	**Max**	**Avg**	**Min**	**Max**	**Avg**	**Min**	**Max**	**Avg**	**Min**	**Max**	**Avg**	**Min**	**Max**	**Avg**	**Min**	**Max**	**Avg**	**Min**	**Max**	**Avg**	**Min**	**Max**	**Avg**
Hayden	Avg Ambient Temperature	ºC	13.2	39.4	26.31	4.7	37.8	20.14	1.5	30	15.17	-5	23.4	8.40	-7.8	20.9	8.05	NA	NA	NA	3.4	35.5	18.75	6.5	34.5	20.92	10.2	39.4	27.11	14.7	41.6	30.88
	Avg Ambient Pressure	mm Hg	697	709	703.35	643	712	703.34	699	716	705.12	694	715	707.44	700	714	706.67	NA	NA	NA	695	716	705.72	677	709	702.97	689	706	702.23	688	707	702.37
	Avg Ambient Relative Humidity	%	4.6	87.7	29.90	4.6	89.5	29.17	5.5	67.6	18.51	6.4	92.9	28.48	6.5	89.8	35.85	NA	NA	NA	4.8	82.9	15.32	5	74.3	13.91	4.4	32.8	7.82	4.3	74.6	7.36
Winkelman	Avg Ambient Temperature	ºC	14	38.8	26.48	7	37.2	21.28	2.7	31.5	16.98	-2.6	24.5	10.56	-5.7	22.3	9.55	6.7	14.6	11.10	-0.2	35.6	18.23	9.6	34.8	23.88	11	39.3	27.09	15.6	41.5	30.86
	Avg Ambient Pressure	mm Hg	700	712	706.56	664	714	705.04	700	718	706.33	695	717	708.97	701	715	708.12	700	706	703.07	695	715	706.28	691	709	704.48	665	707	702.63	678	707	702.60
	Avg Ambient Relative Humidity	%	4.9	86.3	30.18	5.1	83.1	29.56	5.5	66.8	19.62	6.4	82	27.30	6.5	81.2	33.91	8.8	36	20.41	4.9	77.6	16.90	5	37.5	11.68	4.4	33.6	9.27	4.4	65.8	7.96
	Rainfall [1]	in.	09/04/06 - 0.39 09/15/06 - 0.79			10/10/06 - 1.00 10/25/06 - 0.90			11/01/06 - 0.16			12/29/06 - 0.68			01/12/07 - 0.81 01/19/07 - 1.00			02/13/07 - 0.10 02/14/07 - 0.13 02/20/07 - 0.31			03/26/07 - 0.57			04/26/07 - 1.80								

TABLE 4-30
Summary of Meteorological Data
Hayden and Winkelman Monitoring Stations
Remedial Investigation Report
ASARCO LLC Hayden, Arizona Plant Site

		Month/Year:	July 2007			August 2007			September 2007			October 2007			November 2007		
Monitoring Station	**Parameter**	**Units**	**Min**	**Max**	**Avg**	**Min**	**Max**	**Avg**	**Min**	**Max**	**Avg**	**Min**	**Max**	**Avg**	**Min**	**Max**	**Avg**
Hayden	Avg Ambient Temperature	ºC	22.3	45	32.26	21.1	43	31.94	13.7	40.1	29.06	7.2	36.6	22.93	2.6	33	18.32
	Avg Ambient Pressure	mm Hg	699	707	703.19	698	707	703.04	699	708	703.27	675	714	704.10	699	710	705.03
	Avg Ambient Relative Humidity	%	3.9	74.6	16.80	4	75.3	17.79	4.4	72.1	10.61	4.7	58.1	9.52	5.1	83.8	9.43
Winkelman	Avg Ambient Temperature	ºC	22.6	44.2	32.16	20.8	42.8	31.79	14.9	40.1	29.03	7.8	36.4	23.00	3.9	33.6	19.11
	Avg Ambient Pressure	mm Hg	699	707	703.45	698	708	703.22	699	708	703.48	675	714	704.70	697	710	705.30
	Avg Ambient Relative Humidity	%	4	70.4	17.99	4.1	69.2	18.90	4.4	66.1	11.29	4.8	53.5	9.44	5	82.3	10.18
	Rainfall [1]	in.							09/10/07 - 5.10 09/14/07 - 0.42 09/24/07 - 2.52			10/08/07 - 0.06					

Table Notes:

[1] Precipitation measurements are recorded manually by a Hayden-Winkelman High School employee; measurement reliability cannot be verified. A rain gauge was not installed at the Hayden monitoring station.
[2] 08/25/06 - 0.29 = date - rain measurement
[3] ºC = Degrees Celsius
[4] % = Percent
[5] mm Hg = Millimeters of mercury
[6] NA = Not available

TABLE 4-31

PM_{10} Air Filter Sampling Laboratory Values for Inorganic Parameters

Hayden Monitoring Station

Remedial Investigation Report

ASARCO LLC Hayden, Arizona Plant Site

The data in this table are illustrated on figures 2-6, 4-55, 4-56, 4-57, 4-58, 4-59, and 4-60.

Date:		Arizona Hazardous Air Pollutants Ambient Air Concentrations (Acute)[1]	Arizona Hazardous Air Pollutants Ambient Air Concentrations (Chronic)[1]	Arizona Ambient Air Quality Standards[2]	EPA Region IX Preliminary Remediation Goal[3]	EPA National Ambient Air Quality Standards[4]	California Acute Reference Exposure Levels[5 6]	10/22/06			10/28/06			11/03/06			11/09/06			11/15/06			11/21/06		
Avg Wind Speed mph):								5.41			9.26			5.47			3.23			6.71			5.16		
Avg Wind Direction (degrees):								78			49			126			233			59			99		
Avg Ambient Temperature (ºC):								19.2			20.1			17.6			17.7			15.6			17.8		
Avg Ambient Relative Humidity (%):								18.4			9.7			16.7			15.9			15.7			17.6		
Precipitation (inches)[13]:								NPR			10/25 - 0.90			11/1 - 0.16			NPR			NPR			NPR		
Parameter	Units							Result	Percent[12]	Qual	Result	Percent[12]	Qual	Result	Percent[12]	Qual	Result	Percent[12]	Qual	Result	Percent[12]	Qual	Result	Percent[12]	Qual
PM_{10}	µg/m³	--	--	150 [7]/50 [8]	--	150 [7]	--	0.84	NA		R	NA		38.98	NA		37.90	NA		30.62	NA		**51.53**	NA	
Aluminum	µg/m³	--	--	--	5.1	--	--	0.0075	0.0000	*	R	R		1.1940	3.219		1.2870	3.592		0.7232	2.465		1.1200	2.274	
Antimony	µg/m³	13,000	1.46	--	--	--	--	0.0096	0.0000	*	R	R		0.0111	0.0239	*	0.0102	0.0000	*	0.0102	0.0047	*	0.0126	0.0109	*
Arsenic	µg/m³	2,500	0.000441	--	0.00045	--	0.19	***0.0009***	0.0000	*	R	R		**0.0097**	0.0260		**0.0073**	0.0204		**0.0189**	0.0645		**0.1040**	0.2112	J
Barium	µg/m³	--	--	--	0.52	--	--	0.0042	0.3866	*	R	R		0.0129	0.0258	*	0.0147	0.0411		0.0147	0.0501		0.0599	0.1217	
Bismuth	µg/m³	--	--	--	--	--	--	NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA	
Bromine	µg/m³	--	--	--	--	--	--	0.0009	0.0000	*	R	R		0.0015	0.0014	*	0.0012	0.0028	*	0.0015	0.0002	*	0.006	0.0000	*
Cadmium	µg/m³	250	0.00105	--	0.0011	--	--	***0.0069***	0.0000	*	R	R		***0.0072***	0.0000	*	***0.0072***	0.0000	*	***0.0075***	0.0075	*	**0.0166**	0.0337	
Calcium	µg/m³	--	--	--	--	--	--	0.0015	0.0000	*	R	R		0.8640	2.330		0.8353	2.331		0.5711	1.947		0.9158	1.859	
Chlorine	µg/m³	--	--	--	--	--	--	0.0045	0.0238	*	R	R		0.009	0.0000	*	0.0156	0.0436		0.0087	0.0188	*	0.0282	0.0000	*
Chromium	µg/m³	100	0.000158	--	0.00016	--	--	***0.0009***	0.0000	*	R	R		***0.0015***	0.0018	*	***0.0015***	0.0012	*	**0.0016**	0.0056		***0.0021***	0.0033	*
Cobalt	µg/m³	10,000	0.000686	--	0.00069	--	--	***0.0027***	0.0000	*	R	R		***0.0177***	0.0000	*	***0.0168***	0.0000	*	***0.0303***	0.0000	*	***0.0513***	0.0000	*
Copper	µg/m³	--	--	--	--	--	100	0.0018	0.0178	*	R	R		0.2450	0.6607		0.2338	0.6524		0.7740	2.639		3.9970	8.116	
Gallium	µg/m³	--	--	--	--	--	--	0.0012	0.0000	*	R	R		0.0015	0.0000	*	0.0015	0.0000	*	0.0015	0.0000	*	0.0072	0.0000	*
Germanium	µg/m³	--	--	--	--	--	--	0.0009	0.0000	*	R	R		0.0012	0.0000	*	0.0012	0.0000	*	0.0012	0.0000	*	0.0018	0.0000	*
Indium	µg/m³	--	--	--	--	--	--	0.0075	0.2022	*	R	R		0.0081	0.0000	*	0.0078	0.0000	*	0.0081	0.0120	*	0.0099	0.0099	*
Iron	µg/m³	--	--	--	--	--	--	0.0021	0.0000	*	R	R		0.9883	2.665		1.0100	2.820		1.7310	5.902		3.1050	6.304	
Lanthanum	µg/m³	--	--	--	--	--	--	0.0033	0.0892	*	R	R		0.021	0.0000	*	0.0228	0.0000	*	0.0189	0.0000	*	0.0336	0.0000	*
Lead	µg/m³	--	--	1.5 [9,10,11]	--	1.5 [9,10,11]	--	0.0024	0.0000	*	R	R		0.0266	0.0716		0.0141	0.0393		0.0440	0.1501		0.5947	1.207	
Magnesium	µg/m³	--	--	--	--	--	--	0.0132	1.195	*	R	R		0.1364	0.3678		0.1865	0.5206		0.1000	0.3409		0.1817	0.3690	
Manganese	µg/m³	2,500	0.0521	--	0.051	--	--	0.0012	0.0000	*	R	R		0.0153	0.0411		0.0171	0.0477		0.0109	0.0372		0.0187	0.0380	
Mercury	µg/m³	1,000	0.313	--	0.31	--	1.8	0.0024	0.0000	*	R	R		0.003	0.0000	*	0.003	0.0000	*	0.003	0.0000	*	0.0045	0.0000	*
Molybdenum	µg/m³	--	--	--	--	--	--	0.0027	0.0000	*	R	R		0.0050	0.0136		0.0032	0.0088		0.0188	0.0642		0.0773	0.1569	
Nickel	µg/m³	5,000	0.0079	--	0.008	--	6	0.0021	0.0000	*	R	R		0.0024	0.0000	*	0.0024	0.0000	*	0.0024	0.0000	*	0.003	0.0000	*
Palladium	µg/m³	--	--	--	--	--	--	0.0066	0.0000	*	R	R		0.0069	0.0025	*	0.0069	0.0011	*	0.0069	0.0000	*	0.0084	0.0000	*
Phosphorus	µg/m³	--	--	--	--	--	--	0.0039	0.0000	*	R	R		0.0081	0.0000	*	0.0075	0.0000	*	0.0072	0.0000	*	0.0105	0.0000	*
Potassium	µg/m³	--	--	--	--	--	--	0.0021	0.0000	*	R	R		0.5932	1.600		0.5499	1.535		0.3041	1.037		0.5400	1.097	
Rubidium	µg/m³	--	--	--	--	--	--	0.0012	0.0000	*	R	R		0.0020	0.0055		0.0026	0.0072		0.0015	0.0005	*	0.0064	0.0129	
Selenium	µg/m³	500	18.3	--	--	--	--	0.0009	0.0000	*	R	R		0.0012	0.0000	*	0.0049	0.0137		0.0196	0.0669		0.0417	0.0846	J
Silicon	µg/m³	--	--	--	--	--	--	0.0051	0.0000	*	R	R		2.8920	7.798		3.1740	8.859		1.9440	6.628		3.0730	6.239	
Silver	µg/m³	--	--	--	--	--	--	0.0066	0.0000	*	R	R		0.0072	0.0088	*	0.0069	0.0008	*	0.0072	0.0000	*	0.0087	0.0062	*
Sodium	µg/m³	--	--	--	--	--	--	0.0261	1.332	*	R	R		0.1482	0.2900	*	0.0648	0.0374	*	0.0591	0.0734	*	0.0945	0.0000	*
Strontium	µg/m³	--	--	--	--	--	--	0.0015	0.0000	*	R	R		0.0036	0.0098		0.0048	0.0133		0.0024	0.0083		0.0056	0.0114	
Sulfur	µg/m³	--	--	--	--	--	--	0.0027	0.1368	*	R	R		0.7863	2.120		0.4977	1.389		0.6290	2.144		2.0260	4.113	
Tin	µg/m³	--	--	--	--	--	--	0.0084	0.0000	*	R	R		0.0093	0.0179	*	0.0087	0.0000	*	0.009	0.0175	*	0.0114	0.0202	*
Titanium	µg/m³	--	--	--	31	--	--	0.0009	0.0357	*	R	R		0.0878	0.2367		0.0994	0.2775		0.0719	0.2453		0.1315	0.2670	
Vanadium	µg/m³	--	--	--	--	--	--	0.0010	0.1308		R	R		0.0036	0.0000	*	0.0042	0.0000	*	0.0033	0.0000	*	0.0063	0.0000	*
Yttrium	µg/m³	--	--	--	--	--	--	0.0015	0.0238	*	R	R		0.0018	0.0000	*	0.0018	0.0000	*	0.0018	0.0000	*	0.006	0.0000	*
Zinc	µg/m³	--	--	--	--	--	--	0.0015	0.1130	*	R	R		0.0210	0.0565		0.0201	0.0293	*	0.0573	0.1952		0.4381	0.8895	
Zirconium	µg/m³	--	--	--	--	--	--	0.0021	0.0178	*	R	R		0.0024	0.0055	*	0.0024	0.0067		0.0029	0.0100		0.0044	0.0089	

Table Notes:

[1] Arizona Department of Environmental Quality Acute and Chronic Ambient Air Concentrations, Title 18 Chapter 2 Article 17, December 2007
[2] Arizona Department of Environmental Quality Ambient Air Quality Standards, Title 18 Chapter 2 Article 2, December 2007
[3] EPA Region IX Preliminary Remediation Goals, Ambient Air, October 2004
[4] EPA National Ambient Air Quality Standards, http://www.epa.gov/air/criteria.html, February 2008
[5] California Acute Reference Exposure Levels, March 1999
[6] With the exception of arsenic, the averaging time for all listed analytes is one hour. The averaging time for arsenic is four hours.
[7] The averaging time for the criteria is 24 hours.
[8] The averaging time for the criteria is the annual arithmetic mean.
[9] The averaging time for the criteria is the quarterly average.
[10] Only the PM10 fraction is being measured not the total suspended particulates.
[11] On May 20, 2008, EPA proposed to revise the National Ambient Air Quality (NAAQS) for lead to within the range of 0.1-0.3 mg/m³.
[12] Percent of Total Mass
[13] Precipitation measurements are recorded manually by a Hayden-Winkelman High School employee; reliability cannot be verified.
[14] Bold values with bold outline indicate the result exceeds one or more of the comparison criteria.
[15] Bold italicized values indicate the non-detected result exceeds one or more of the comparison criteria.
[16] * = The result is less than three times the level of uncertainty which is shown in place of the result.
[17] -- = Not established
[18] ºC = Degrees Celsius
[19] % = Percent
[20] J = Estimated value
[21] mph = miles per hour
[22] NA = Not Applicable or Not analyzed
[23] NPR = No precipitation recorded.
[24] NV = Not valid
[25] µg/m³ = Micrograms per cubic meter
[26] PM_{10} = particulate matter with a diameter less than or equal to 10 microns in size
[27] R = Rejected
[28] This table should be considered preliminary and will be revised based on incoming data, final data validation and QA/QC.

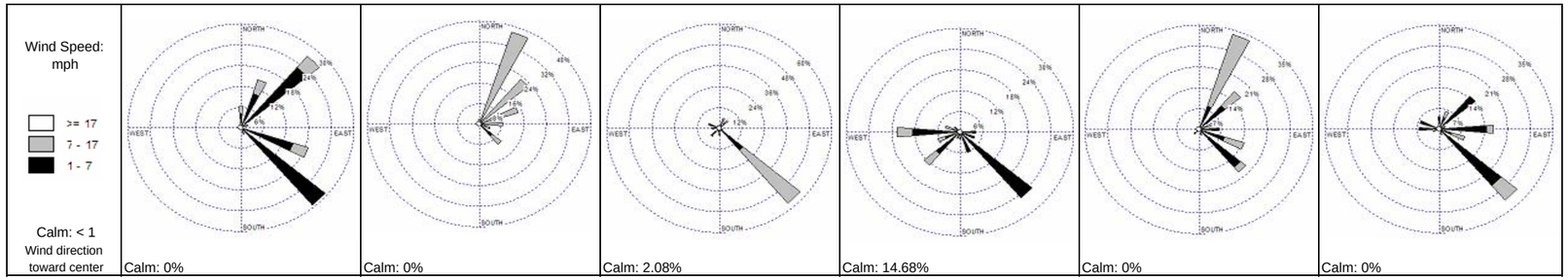

TABLE 4-31

PM_{10} Air Filter Sampling Laboratory Values for Inorganic Parameters

Hayden Monitoring Station

Remedial Investigation Report

ASARCO LLC Hayden, Arizona Plant Site

The data in this table are illustrated on figures 2-6, 4-55, 4-56, 4-57, 4-58, 4-59, and 4-60.

Date:								11/27/06			12/03/06			12/09/06			12/15/06			12/21/06			12/27/06		
Avg Wind Speed mph):								3.48			13.11			6.15			3.60			3.73			4.41		
Avg Wind Direction (degrees):								227			72			63			131			222			173		
Avg Ambient Temperature (ºC):								10.1			11.6			13.7			10.6			3.8			8.8		
Avg Ambient Relative Humidity (%):								28.8			8.2			23.3			22.8			29.1			16.7		
Precipitation (inches)[13]:								NPR			NPR			NPR			NPR			NPR			NPR		
Parameter	Units	Arizona Hazardous Air Pollutants Ambient Air Concentrations (Acute)[1]	Arizona Hazardous Air Pollutants Ambient Air Concentrations (Chronic)[1]	Arizona Ambient Air Quality Standards[2]	EPA Region IX Preliminary Remediation Goal[3]	EPA National Ambient Air Quality Standards[4]	California Acute Reference Exposure Levels[5 6]	Result	Percent[12]	Qual	Result	Percent[12]	Qual	Result	Percent[12]	Qual	Result	Percent[12]	Qual	Result	Percent[12]	Qual	Result	Percent[12]	Qual
PM_{10}	µg/m³	--	--	150 [7]/50 [8]	--	150 [7]	--	31.58	NA		48.20	NA		36.71	NA		27.61	NA		0.46	NA		15.01	NA	
Aluminum	µg/m³	--	--	--	5.1	--	--	0.5645	1.836		1.2130	2.558		NA	NA		1.0290	3.830	J	0.0084	0.7602	*	0.4944	3.380	
Antimony	µg/m³	13,000	1.46	--	--	--	--	0.0105	0.0000	*	0.0117	0.0211	*	NA	NA		0.0102	0.0000	*J	0.0102	0.0000	*	0.0108	0.0393	*
Arsenic	µg/m³	2,500	0.000441	--	0.00045	--	0.19	**0.0098**	0.0320		**0.0484**	0.1021	J	NA	NA		**0.0074**	0.0277	J	***0.0012***	0.0000	*	**0.0045**	0.0309	
Barium	µg/m³	--	--	--	0.52	--	--	0.0087	0.0021	*	0.0186	0.0391		NA	NA		0.0152	0.0564	J	0.0045	0.3801	*	0.0078	0.0000	*
Bismuth	µg/m³	--	--	--	--	--	--	NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA	
Bromine	µg/m³	--	--	--	--	--	--	0.0023	0.0075		0.0024	0.0021	*	NA	NA		0.0016	0.0058	J	0.0012	0.0000	*	0.0024	0.0164	
Cadmium	µg/m³	250	0.00105	--	0.0011	--	--	***0.0075***	0.0104	*	***0.0084***	0.0088	*	NA	NA		***0.0072***	0.0000	*J	***0.0069***	0.0000	*	***0.0075***	0.0000	*
Calcium	µg/m³	--	--	--	--	--	--	0.5038	1.638		1.0930	2.305		NA	NA		0.8178	3.043	J	0.0093	2.034		0.5005	3.422	
Chlorine	µg/m³	--	--	--	--	--	--	0.2548	0.8287		0.0129	0.0000	*	NA	NA		0.0198	0.0736	J	0.0048	0.0000	*	0.0205	0.1404	
Chromium	µg/m³	100	0.000158	--	0.00016	--	--	***0.0012***	0.0024	*	**0.0025**	0.0053		NA	NA		***0.0015***	0.0035	*J	***0.0012***	0.0000	*	***0.0012***	0.0055	*
Cobalt	µg/m³	10,000	0.000686	--	0.00069	--	--	***0.0111***	0.0000	*	***0.0315***	0.0000	*	NA	NA		***0.0177***	0.0000	*J	***0.003***	0.0000	*	***0.0081***	0.0000	*
Copper	µg/m³	--	--	--	--	--	100	0.2930	0.9527		1.1960	2.522		NA	NA		0.4897	1.822	J	0.0047	1.017		0.1597	1.092	
Gallium	µg/m³	--	--	--	--	--	--	0.0015	0.0000	*	0.0024	0.0000	*	NA	NA		0.0015	0.0000	*J	0.0012	0.0000	*	0.0015	0.0000	*
Germanium	µg/m³	--	--	--	--	--	--	0.0012	0.0000	*	0.0015	0.0000	*	NA	NA		0.0012	0.0000	*J	0.0012	0.0000	*	0.0012	0.0000	*
Indium	µg/m³	--	--	--	--	--	--	0.0081	0.0087	*	0.0087	0.0036	*	NA	NA		0.0078	0.0000	*J	0.0078	0.0000	*	0.0081	0.0000	*
Iron	µg/m³	--	--	--	--	--	--	0.6008	1.954		1.9070	4.022		NA	NA		1.0560	3.928	J	0.0126	2.743		0.4821	3.297	
Lanthanum	µg/m³	--	--	--	--	--	--	0.0141	0.0000	*	0.0267	0.0000	*	NA	NA		0.0213	0.0000	*J	0.0039	0.0000	*	0.0126	0.0000	*
Lead	µg/m³	--	--	1.5 [9,10,11]	--	1.5 [9,10,11]	--	0.0191	0.0622		0.1595	0.3363		NA	NA		0.0329	0.1223	J	0.0027	0.0000	*	0.0143	0.0975	
Magnesium	µg/m³	--	--	--	--	--	--	0.0985	0.3205		0.1161	0.2449		NA	NA		0.1235	0.4595	J	0.0138	0.0000	*	0.0818	0.5595	
Manganese	µg/m³	2,500	0.0521	--	0.051	--	--	0.0079	0.0257		0.0170	0.0358		NA	NA		0.0167	0.0620	J	0.0015	0.0000	*	0.0087	0.0592	
Mercury	µg/m³	1,000	0.313	--	0.31	--	1.8	0.003	0.0000	*	0.0033	0.0000	*	NA	NA		0.003	0.0000	*J	0.0027	0.0000	*	0.003	0.0000	*
Molybdenum	µg/m³	--	--	--	--	--	--	0.0052	0.0170		0.0314	0.0662		NA	NA		0.0102	0.0380	J	0.003	0.0103	*	0.0033	0.0177	*
Nickel	µg/m³	5,000	0.0079	--	0.008	--	6	0.0024	0.0026	*	0.0027	0.0000	*	NA	NA		0.0024	0.0000	*J	0.0024	0.0000	*	0.0024	0.0000	*
Palladium	µg/m³	--	--	--	--	--	--	0.0069	0.0000	*	0.0075	0.0026	*	NA	NA		0.0069	0.0039	*J	0.0066	0.0000	*	0.0069	0.0029	*
Phosphorus	µg/m³	--	--	--	--	--	--	0.0063	0.0000	*	0.009	0.0000	*	NA	NA		0.0075	0.0000	*J	0.0042	0.5445	*	0.006	0.0000	*
Potassium	µg/m³	--	--	--	--	--	--	0.2791	0.9077		0.5989	1.263		NA	NA		0.4953	1.843	J	0.0036	0.7807		0.2425	1.658	
Rubidium	µg/m³	--	--	--	--	--	--	0.0015	0.0009	*	0.0025	0.0054		NA	NA		0.0019	0.0072	J	0.0015	0.1438	*	0.0015	0.0087	*
Selenium	µg/m³	500	18.3	--	--	--	--	0.0012	0.0026	*	0.0108	0.0228	J	NA	NA		0.0025	0.0095	J	0.0012	0.0000	*	0.0025	0.0171	
Silicon	µg/m³	--	--	--	--	--	--	1.4820	4.820		3.1640	6.672		NA	NA		2.6880	10.00	J	0.0235	5.126		1.2450	8.512	
Silver	µg/m³	--	--	--	--	--	--	0.0072	0.0000	*	0.0078	0.0028	*	NA	NA		0.0069	0.0000	*J	0.0069	0.0000	*	0.0072	0.0000	*
Sodium	µg/m³	--	--	--	--	--	--	0.2163	0.7034		0.0753	0.0586	*	NA	NA		0.0621	0.0145	*J	0.0285	0.0000	*	0.0459	0.0905	*
Strontium	µg/m³	--	--	--	--	--	--	0.0024	0.0078		0.0070	0.0147		NA	NA		0.0048	0.0179	J	0.0015	0.0000	*	0.0032	0.0216	
Sulfur	µg/m³	--	--	--	--	--	--	0.4770	1.551		1.2640	2.666		NA	NA		0.6964	2.591	J	0.003	0.5239	*	0.2978	2.036	
Tin	µg/m³	--	--	--	--	--	--	0.0096	0.0204	*	0.0102	0.0101	*	NA	NA		0.009	0.0079	*J	0.009	0.0000	*	0.0093	0.0119	*
Titanium	µg/m³	--	--	--	31	--	--	0.0472	0.1534		0.1166	0.2459		NA	NA		0.0888	0.3306	J	0.0014	0.3082		0.0395	0.2698	
Vanadium	µg/m³	--	--	--	--	--	--	0.0024	0.0000	*	0.0048	0.0000	*	NA	NA		0.0039	0.0000	*J	0.0009	0.0925	*	0.0021	0.0000	*
Yttrium	µg/m³	--	--	--	--	--	--	0.0018	0.0000	*	0.0024	0.0000	*	NA	NA		0.0018	0.0000	*J	0.0018	0.0000	*	0.0018	0.0000	*
Zinc	µg/m³	--	--	--	--	--	--	0.0188	0.0612		0.1484	0.3129		NA	NA		0.0334	0.1242	J	0.0015	0.0000	*	0.0109	0.0747	
Zirconium	µg/m³	--	--	--	--	--	--	0.0021	0.0034	*	0.0041	0.0086		NA	NA		0.0023	0.0084	J	0.0021	0.0000	*	0.0024	0.0039	*

Table Notes:

[1] Arizona Department of Environmental Quality Acute and Chronic Ambient Air Concentrations, Title 18 Chapter 2 Article 17, December 2007
[2] Arizona Department of Environmental Quality Ambient Air Quality Standards, Title 18 Chapter 2 Article 2, December 2007
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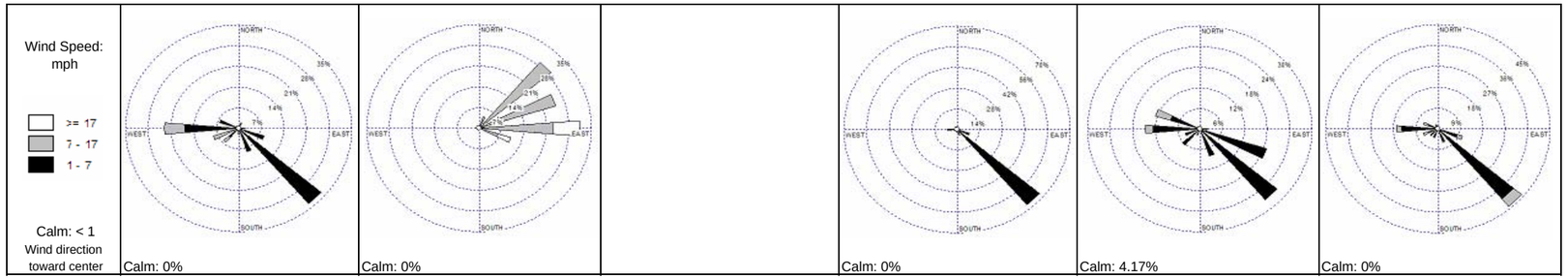

TABLE 4-31

PM_{10} Air Filter Sampling Laboratory Values for Inorganic Parameters

Hayden Monitoring Station

Remedial Investigation Report

ASARCO LLC Hayden, Arizona Plant Site

The data in this table are illustrated on figures 2-6, 4-55, 4-56, 4-57, 4-58, 4-59, and 4-60.

Date:		Arizona Hazardous Air Pollutants Ambient Air Concentrations (Acute)[1]	Arizona Hazardous Air Pollutants Ambient Air Concentrations (Chronic)[1]	Arizona Ambient Air Quality Standards[2]	EPA Region IX Preliminary Remediation Goal[3]	EPA National Ambient Air Quality Standards[4]	California Acute Reference Exposure Levels[5 6]	01/08/07			01/14/07			01/20/07			01/26/07			02/01/07			02/07/07		
Avg Wind Speed mph):								7.52			3.54			2.49			4.85			2.24			4.29		
Avg Wind Direction (degrees):								87			258			103			101			322			144		
Avg Ambient Temperature (ºC):								12.7			0.9			5.2			9			8			15		
Avg Ambient Relative Humidity (%):								13.9			15.7			69.4			38.4			47			16.4		
Precipitation (inches)[13]:								NPR			1/12 - 0.81			1/19 - 1.00			NPR			NPR			NPR		
Parameter	**Units**							**Result**	**Percent[12]**	**Qual**	**Result**	**Percent[12]**	**Qual**	**Result**	**Percent[12]**	**Qual**	**Result**	**Percent[12]**	**Qual**	**Result**	**Percent[12]**	**Qual**	**Result**	**Percent[12]**	**Qual**
PM_{10}	µg/m³	--	--	150 [7]/50 [8]	--	150 [7]	--	39.67	NA		16.56	NA		12.10	NA		17.36	NA		9.81	NA		33.20	NA	
Aluminum	µg/m³	--	--	--	5.1	--	--	0.5358	1.384		0.4583	2.729		0.3764	3.126		0.6987	4.100		0.1835	1.906		1.0070	3.147	
Antimony	µg/m³	13,000	1.46	--	--	--	--	0.0126	0.0296	*	0.0105	0.0384	*	0.0072	0.0149	*	0.0072	0.0149	*	0.0072	0.0186	*	0.0072	0.0000	*
Arsenic	µg/m³	2,500	0.000441	--	0.00045	--	0.19	**0.1524**	0.3936		**0.0107**	0.0637		**0.0034**	0.0282		**0.0073**	0.0431		***0.0021***	0.0064	*	**0.0071**	0.0221	
Barium	µg/m³	--	--	--	0.52	--	--	0.0427	0.1103		0.0075	0.0000	*	0.0072	0.0000	*	0.012	0.0229	*	0.0054	0.0259	*	0.012	0.0193	*
Bismuth	µg/m³	--	--	--	--	--	--	0.1432	0.3700		0.0053	0.0317		NA	NA		NA	NA		NA	NA		NA	NA	
Bromine	µg/m³	--	--	--	--	--	--	0.0048	0.0000	*	0.0018	0.0107		0.0018	0.0152		0.0009	0.0000	*	0.0016	0.0171		0.0025	0.0078	
Cadmium	µg/m³	250	0.00105	--	0.0011	--	--	**0.0141**	0.0365		***0.0072***	0.0000	*	***0.0051***	0.0000	*	***0.0051***	0.0000	*	***0.0051***	0.0113	*	***0.0051***	0.0016	*
Calcium	µg/m³	--	--	--	--	--	--	0.6069	1.568		0.4480	2.668		0.3021	2.509		0.4741	2.782		0.2901	3.014		0.7830	2.447	
Chlorine	µg/m³	--	--	--	--	--	--	0.0198	0.0000	*	0.3088	1.839		0.0217	0.1803		0.0075	0.0204	*	0.0256	0.2656		0.0125	0.0390	
Chromium	µg/m³	100	0.000158	--	0.00016	--	--	***0.0015***	0.0030	*	***0.0012***	0.0042	*	**0.0022**	0.0180		***0.0009***	0.0022	*	**0.0060**	0.0621		**0.0017**	0.0054	J
Cobalt	µg/m³	10,000	0.000686	--	0.00069	--	--	***0.0279***	0.0000	*	***0.0084***	0.0000	*	***0.0093***	0.0000	*	***0.0153***	0.0000	*	***0.006***	0.0000	*	***0.0156***	0.0000	*
Copper	µg/m³	--	--	--	--	--	100	2.7340	7.063		0.1662	0.9895		0.1678	1.394		0.3001	1.761		0.0596	0.6188		0.3394	1.061	
Gallium	µg/m³	--	--	--	--	--	--	0.0051	0.0000	*	0.0012	0.0000	*	0.0015	0.0000	*	0.0015	0.0000	*	0.0015	0.0000	*	0.0015	0.0000	*
Germanium	µg/m³	--	--	--	--	--	--	0.0015	0.0000	*	0.0012	0.0000	*	0.0012	0.0000	*	0.0012	0.0000	*	0.0012	0.0000	*	0.0012	0.0000	*
Indium	µg/m³	--	--	--	--	--	--	0.0093	0.0044	*	0.0078	0.0053	*	0.0054	0.0000	*	0.0054	0.0000	*	0.0057	0.0181	*	0.0054	0.0000	*
Iron	µg/m³	--	--	--	--	--	--	1.6690	4.312		0.4682	2.789		0.4878	4.051		0.8301	4.871		0.2877	2.989		0.9007	2.815	
Lanthanum	µg/m³	--	--	--	--	--	--	0.0195	0.0000	*	0.0123	0.0000	*	0.012	0.0109	*	0.0201	0.0000	*	0.0084	0.0000	*	0.0204	0.0119	*
Lead	µg/m³	--	--	1.5 [9,10,11]	--	1.5 [9,10,11]	--	0.4700	1.214		0.0167	0.0993		0.0043	0.0360		0.0099	0.0580		0.0050	0.0523		0.0103	0.0321	
Magnesium	µg/m³	--	--	--	--	--	--	0.0759	0.1418	*	0.0916	0.5454		0.0892	0.7410		0.1713	1.005		0.0371	0.3860		0.2610	0.8156	
Manganese	µg/m³	2,500	0.0521	--	0.051	--	--	0.0091	0.0236		0.0071	0.0423		0.0081	0.0669		0.0091	0.0533		0.0035	0.0362		0.0103	0.0321	
Mercury	µg/m³	1,000	0.313	--	0.31	--	1.8	0.0039	0.0000	*	0.0027	0.0000	*	0.0021	0.0000	*	0.0021	0.0000	*	0.0021	0.0000	*	0.0021	0.0000	*
Molybdenum	µg/m³	--	--	--	--	--	--	0.0505	0.1304		0.0043	0.0258		0.0046	0.0379		0.0092	0.0542		0.003	0.0059	*	0.0059	0.0185	
Nickel	µg/m³	5,000	0.0079	--	0.008	--	6	0.003	0.0000	*	0.0021	0.0039	*	0.0019	0.0160		0.0021	0.0036	*	0.0018	0.0127	*	0.0018	0.0024	*
Palladium	µg/m³	--	--	--	--	--	--	0.0078	0.0000	*	0.0066	0.0093	*	0.0048	0.0000	*	0.0051	0.0160	*	0.0048	0.0000	*	0.0051	0.0012	*
Phosphorus	µg/m³	--	--	--	--	--	--	0.0093	0.0000	*	0.006	0.0000	*	0.0039	0.0000	*	0.0048	0.0000	*	0.0036	0.0000	*	0.0057	0.0000	*
Potassium	µg/m³	--	--	--	--	--	--	0.2211	0.5712		0.2673	1.592		0.2137	1.775		0.3308	1.941		0.1086	1.128		0.3519	1.100	
Rubidium	µg/m³	--	--	--	--	--	--	0.0043	0.0111		0.0015	0.0084	*	0.0012	0.0059	*	0.0012	0.0066	*	0.0012	0.0000	*	0.0012	0.0016	*
Selenium	µg/m³	500	18.3	--	--	--	--	0.1217	0.3144		0.0012	0.0067	*	0.0009	0.0000	*	0.0009	0.0000	*	0.0009	0.0000	*	0.0012	0.0029	*
Silicon	µg/m³	--	--	--	--	--	--	1.5750	4.070		1.2330	7.344		0.9035	7.503		1.7920	10.52		0.4831	5.019		2.5760	8.050	
Silver	µg/m³	--	--	--	--	--	--	0.009	0.0199	*	0.0069	0.0000	*	0.0048	0.0008	*	0.0048	0.0036	*	0.0051	0.0093	*	0.0051	0.0050	*
Sodium	µg/m³	--	--	--	--	--	--	0.0822	0.0000	*	0.1791	1.067		0.1119	0.7237	*	0.0489	0.0000	*	0.1014	0.7563	*	0.06	0.1129	*
Strontium	µg/m³	--	--	--	--	--	--	0.0023	0.0060		0.0039	0.0230		0.0015	0.0051	*	0.0019	0.0111		0.0015	0.0000	*	0.0019	0.0060	
Sulfur	µg/m³	--	--	--	--	--	--	1.6570	4.282		0.2368	1.410		0.3570	2.965		0.2907	1.706		0.2158	2.242		0.4627	1.446	
Tin	µg/m³	--	--	--	--	--	--	0.0123	0.0317		0.009	0.0000	*	0.0098	0.0813		0.0079	0.0461		0.0069	0.0655	*	0.0114	0.0358	
Titanium	µg/m³	--	--	--	31	--	--	0.0484	0.1252		0.0393	0.2341		0.0464	0.3855		0.0982	0.5763		0.0194	0.2020		0.0993	0.3102	
Vanadium	µg/m³	--	--	--	--	--	--	0.0036	0.0000	*	0.0021	0.0000	*	0.0024	0.0043	*	0.0042	0.0003	*	0.0015	0.0029	*	0.0042	0.0000	*
Yttrium	µg/m³	--	--	--	--	--	--	0.0045	0.0000	*	0.0018	0.0000	*	0.0018	0.0000	*	0.0018	0.0022	*	0.0018	0.0000	*	0.0018	0.0028	*
Zinc	µg/m³	--	--	--	--	--	--	0.2071	0.5350		0.0114	0.0681		0.0162	0.1345		0.0168	0.0984		0.0131	0.1365		0.0289	0.0903	
Zirconium	µg/m³	--	--	--	--	--	--	0.0040	0.0103		0.0021	0.0048	*	0.0021	0.0113	*	0.0030	0.0174		0.0021	0.0225	*	0.0024	0.0077	

Table Notes:

[1] Arizona Department of Environmental Quality Acute and Chronic Ambient Air Concentrations, Title 18 Chapter 2 Article 17, December 2007
[2] Arizona Department of Environmental Quality Ambient Air Quality Standards, Title 18 Chapter 2 Article 2, December 2007
[3] EPA Region IX Preliminary Remediation Goals, Ambient Air, October 2004
[4] EPA National Ambient Air Quality Standards, http://www.epa.gov/air/criteria.html, February 2008
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[6] With the exception of arsenic, the averaging time for all listed analytes is one hour. The averaging time for arsenic is four hours.
[7] The averaging time for the criteria is 24 hours.
[8] The averaging time for the criteria is the annual arithmetic mean.
[9] The averaging time for the criteria is the quarterly average.
[10] Only the PM10 fraction is being measured not the total suspended particulates.
[11] On May 20, 2008, EPA proposed to revise the National Ambient Air Quality (NAAQS) for lead to within the range of 0.1-0.3 mg/m³.
[12] Percent of Total Mass
[13] Precipitation measurements are recorded manually by a Hayden-Winkelman High School employee; reliability cannot be verified.
[14] Bold values with bold outline indicate the result exceeds one or more of the comparison criteria.
[15] Bold italicized values indicate the non-detected result exceeds one or more of the comparison criteria.
[16] * = The result is less than three times the level of uncertainty which is shown in place of the result.
[17] -- = Not established
[18] ºC = Degrees Celsius
[19] % = Percent
[20] J = Estimated value
[21] mph = miles per hour
[22] NA = Not Applicable or Not analyzed
[23] NPR = No precipitation recorded.
[24] NV = Not valid
[25] µg/m³ = Micrograms per cubic meter
[26] PM_{10} = particulate matter with a diameter less than or equal to 10 microns in size
[27] R = Rejected
[28] This table should be considered preliminary and will be revised based on incoming data, final data validation and QA/QC.

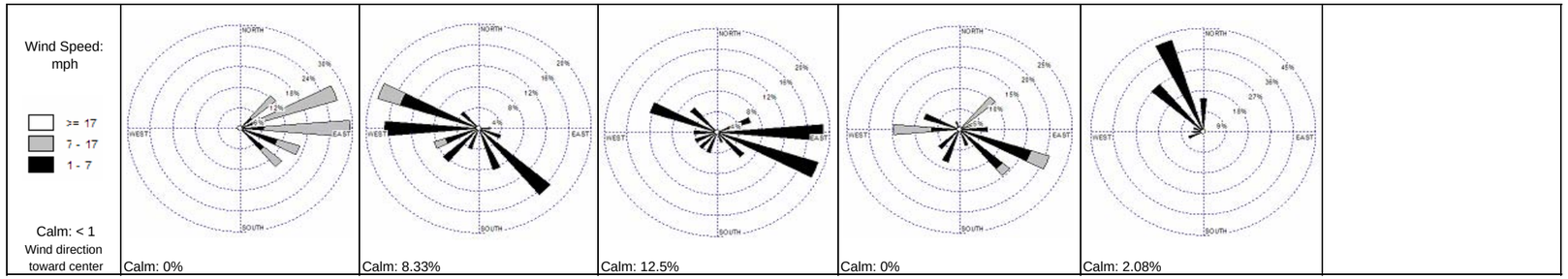

TABLE 4-31

PM_{10} Air Filter Sampling Laboratory Values for Inorganic Parameters

Hayden Monitoring Station

Remedial Investigation Report

ASARCO LLC Hayden, Arizona Plant Site

The data in this table are illustrated on figures 2-6, 4-55, 4-56, 4-57, 4-58, 4-59, and 4-60.

Date:		Arizona Hazardous Air Pollutants Ambient Air Concentrations (Acute)[1]	Arizona Hazardous Air Pollutants Ambient Air Concentrations (Chronic)[1]	Arizona Ambient Air Quality Standards[2]	EPA Region IX Preliminary Remediation Goal[3]	EPA National Ambient Air Quality Standards[4]	California Acute Reference Exposure Levels[5 6]	02/13/07			02/19/07			02/25/07			03/03/07			03/09/07			03/15/07		
Avg Wind Speed mph):								4.72			6.40			4.54			9.01			3.60			3.36		
Avg Wind Direction (degrees):								263			271			218			38			156			206		
Avg Ambient Temperature (ºC):								11.4			12.1			9.9			11.9			19.2			21.3		
Avg Ambient Relative Humidity (%):								38.8			33.6			13.1			8.1			10.8			7.2		
Precipitation (inches)[13]:								2/13 - 0.10			2/14 - 0.13			2/20 - 0.31			NPR			NPR			NPR		
Parameter	**Units**							**Result**	**Percent[12]**	**Qual**	**Result**	**Percent[12]**	**Qual**	**Result**	**Percent[12]**	**Qual**	**Result**	**Percent[12]**	**Qual**	**Result**	**Percent[12]**	**Qual**	**Result**	**Percent[12]**	**Qual**
PM_{10}	µg/m³	--	--	150 [7]/50 [8]	--	150 [7]	--	18.55	NA		27.46	NA		8.64	NA		49.49	NA		R	NA		37.48	NA	
Aluminum	µg/m³	--	--	--	5.1	--	--	0.501	2.783		0.8701	3.278		0.3067	3.625		1.0910	2.250		R	R		1.3820	3.920	
Antimony	µg/m³	13,000	1.46	--	--	--	--	0.0072	0.0120	*	0.0072	0.0099	*	0.0069	0.0122	*	0.0081	0.0063	*	R	R		0.0075	0.0021	*
Arsenic	µg/m³	2,500	0.000441	--	0.00045	--	0.19	**0.0125**	0.0693		**0.0069**	0.0259		**0.0046**	0.0540		**0.0510**	0.1051		R	R		**0.0166**	0.0470	
Barium	µg/m³	--	--	--	0.52	--	--	0.0072	0.0280	*	0.01	0.0376		0.0054	0.0000	*	0.0198	0.0408		R	R		0.0189	0.0494	*
Bismuth	µg/m³	--	--	--	--	--	--	NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA	
Bromine	µg/m³	--	--	--	--	--	--	0.0029	0.0162		0.002	0.0075		0.0009	0.0078	*	0.0018	0.0000	*	R	R		0.0048	0.0138	
Cadmium	µg/m³	250	0.00105	--	0.0011	--	--	***0.0051***	0.0112	*	***0.0051***	3.278	*	***0.0048***	0.0273	*	***0.0057***	0.0043	*	R	R		***0.0054***	0.0009	*
Calcium	µg/m³	--	--	--	--	--	--	0.6003	3.335		0.7547	2.844		0.3211	3.796		0.8607	1.775		R	R		1.2370	3.509	
Chlorine	µg/m³	--	--	--	--	--	--	0.1389	0.7716		0.1138	0.4286		0.0054	0.0000	*	0.0201	0.0000	*	R	R		0.0171	0.0224	*
Chromium	µg/m³	100	0.000158	--	0.00016	--	--	***0.0009***	0.0034	*	**0.0014**	0.0053		***0.0009***	0.0022	*	***0.0018***	0.0008	*	R	R		***0.0018***	0.0047	*
Cobalt	µg/m³	10,000	0.000686	--	0.00069	--	--	***0.0096***	0.0000	*	***0.0162***	0.0000	*	***0.0054***	0.0000	*	***0.0336***	0.0000	*	R	R		***0.0267***	0.0000	*
Copper	µg/m³	--	--	--	--	--	100	0.3156	1.754		0.2372	0.8937		0.0773	0.9140		1.3430	2.770		R	R		0.3433	0.9740	
Gallium	µg/m³	--	--	--	--	--	--	0.0015	0.0000	*	0.0015	0.0000	*	0.0012	0.0000	*	0.0024	0.0000	*	R	R		0.0018	0.0000	*
Germanium	µg/m³	--	--	--	--	--	--	0.0012	0.0000	*	0.0012	0.0000	*	0.0012	0.0000	*	0.0015	0.0000	*	R	R		0.0015	0.0000	*
Indium	µg/m³	--	--	--	--	--	--	0.0054	0.0000	*	0.0057	0.0000	*	0.0051	0.0000	*	0.006	0.0000	*	R	R		0.006	0.0009	*
Iron	µg/m³	--	--	--	--	--	--	0.5109	2.838		0.8758	3.300		0.2548	3.013		1.8260	3.765		R	R		1.4490	4.111	
Lanthanum	µg/m³	--	--	--	--	--	--	0.012	0.0000	*	0.0159	0.0000	*	0.0087	0.0000	*	0.0234	0.0000	*	R	R		0.0309	0.0000	*
Lead	µg/m³	--	--	1.5 [9,10,11]	--	1.5 [9,10,11]	--	0.037	0.2056		0.0173	0.0653		0.0105	0.1236		0.1444	0.2976		R	R		0.0320	0.0907	
Magnesium	µg/m³	--	--	--	--	--	--	0.098	0.5443		0.2014	0.7587		0.0354	0.2405	*	0.1952	0.4025		R	R		0.2162	0.6134	
Manganese	µg/m³	2,500	0.0521	--	0.051	--	--	0.0065	0.0364		0.0185	0.0695		0.0040	0.0479		0.0133	0.0274		R	R		0.0295	0.0836	
Mercury	µg/m³	1,000	0.313	--	0.31	--	1.8	0.0024	0.0000	*	0.0024	0.0000	*	0.0021	0.0000	*	0.0024	0.0000	*	R	R		0.0024	0.0000	*
Molybdenum	µg/m³	--	--	--	--	--	--	0.0068	0.0377		0.0046	0.0174		0.0027	0.0022	*	0.0338	0.0696		R	R		0.0043	0.0123	
Nickel	µg/m³	5,000	0.0079	--	0.008	--	6	0.0021	0.0044	*	0.0021	0.0076	*	0.0021	0.0000	*	0.0024	0.0000	*	R	R		0.0024	0.0016	*
Palladium	µg/m³	--	--	--	--	--	--	0.0051	0.0099	*	0.0048	0.0000	*	0.0048	0.0189	*	0.0051	0.0000	*	R	R		0.0051	0.0009	*
Phosphorus	µg/m³	--	--	--	--	--	--	0.0045	0.0000	*	0.0051	0.0000	*	0.0039	0.0000	*	0.012	0.0000	*	R	R		0.0132	0.0000	*
Potassium	µg/m³	--	--	--	--	--	--	0.2777	1.543		0.3675	1.385		0.1394	1.648		0.4145	0.8547		R	R		0.5377	1.525	
Rubidium	µg/m³	--	--	--	--	--	--	0.0012	0.0000	*	0.0017	0.0064		0.0009	0.0000	*	0.0012	0.0000	*	R	R		0.0016	0.0044	
Selenium	µg/m³	500	18.3	--	--	--	--	0.006	0.0332		0.0024	0.0090		0.0009	0.0000	*	0.0172	0.0354		R	R		0.0012	0.0031	*
Silicon	µg/m³	--	--	--	--	--	--	1.333	7.408		2.378	8.960		0.8310	9.825		2.8800	5.937		R	R		3.8350	10.88	
Silver	µg/m³	--	--	--	--	--	--	0.0051	0.0230	*	0.0051	0.0075	*	0.0045	0.0000	*	0.0054	0.0009	*	R	R		0.0051	0.0000	*
Sodium	µg/m³	--	--	--	--	--	--	0.2253	1.252		0.1928	0.7263		0.039	0.1342	*	0.1551	0.0154	*	R	R		0.1392	0.2736	*
Strontium	µg/m³	--	--	--	--	--	--	0.0015	0.0071	*	0.0035	0.0131		0.0012	0.0134	*	0.0044	0.0090		R	R		0.0071	0.0200	
Sulfur	µg/m³	--	--	--	--	--	--	0.4485	2.491		0.4335	1.633		0.1472	1.741		0.9285	1.914		R	R		0.7689	2.181	
Tin	µg/m³	--	--	--	--	--	--	0.0081	0.0450		0.0072	0.0266	*	0.0066	0.0072	*	0.0078	0.0114	*	R	R		0.0072	0.0000	*
Titanium	µg/m³	--	--	--	31	--	--	0.0446	0.2480		0.0678	0.2553		0.0219	0.2594		0.0943	0.1944		R	R		0.1425	0.4042	
Vanadium	µg/m³	--	--	--	--	--	--	0.0024	0.0055	*	0.003	0.0023	*	0.0015	0.0000	*	0.0045	0.0000	*	R	R		0.0063	0.0000	*
Yttrium	µg/m³	--	--	--	--	--	--	0.0018	0.0000	*	0.0018	0.0000	*	0.0015	0.0022	*	0.0024	0.0000	*	R	R		0.0018	0.0000	*
Zinc	µg/m³	--	--	--	--	--	--	0.0198	0.1099		0.015	0.0566		0.0021	0.0122	*	0.1043	0.2150		R	R		0.0328	0.0930	
Zirconium	µg/m³	--	--	--	--	--	--	0.0021	0.0021	*	0.0021	0.0075	*	0.0021	0.0000	*	0.0021	0.0022	*	R	R		0.0031	0.0088	

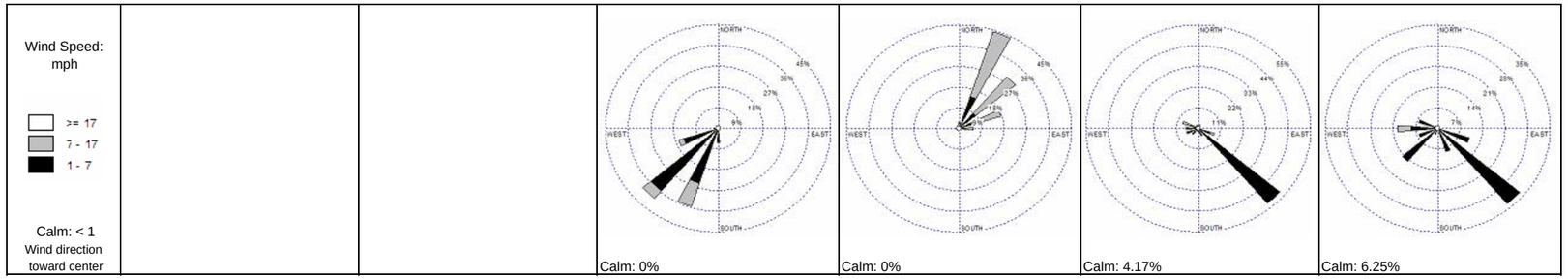

Table Notes:

[1] Arizona Department of Environmental Quality Acute and Chronic Ambient Air Concentrations, Title 18 Chapter 2 Article 17, December 2007
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[28] This table should be considered preliminary and will be revised based on incoming data, final data validation and QA/QC.

TABLE 4-31

PM_{10} Air Filter Sampling Laboratory Values for Inorganic Parameters

Hayden Monitoring Station

Remedial Investigation Report

ASARCO LLC Hayden, Arizona Plant Site

The data in this table are illustrated on figures 2-6, 4-55, 4-56, 4-57, 4-58, 4-59, and 4-60.

Date:								03/21/07			03/27/07			04/02/07			04/20/07			04/26/07			05/02/07		
Avg Wind Speed mph):								6.84			9.20			3.85			5.90			4.10			4.35		
Avg Wind Direction (degrees):								136			244			235			227			251			246		
Avg Ambient Temperature (ºC):								20.3			18.8			21.8			19.3			23.1			25.3		
Avg Ambient Relative Humidity (%):								10.5			17.7			9.6			6.9			9			8.6		
Precipitation (inches)[13]:								NPR			3/26 - 0.57			NPR			NPR			4/26 - 1.80			NPR		
Parameter	Units	Arizona Hazardous Air Pollutants Ambient Air Concentrations (Acute)[1]	Arizona Hazardous Air Pollutants Ambient Air Concentrations (Chronic)[1]	Arizona Ambient Air Quality Standards[2]	EPA Region IX Preliminary Remediation Goal[3]	EPA National Ambient Air Quality Standards[4]	California Acute Reference Exposure Levels[5 6]	Result	Percent[12]	Qual	Result	Percent[12]	Qual	Result	Percent[12]	Qual	Result	Percent[12]	Qual	Result	Percent[12]	Qual	Result	Percent[12]	Qual
PM_{10}	µg/m³	--	--	150 [7]/50 [8]	--	150 [7]	--	**67.75**	NA		**54.27**	NA		30.53	NA		**63.06**	NA		34.02	NA		R	NA	
Aluminum	µg/m³	--	--	--	5.1	--	--	2.5490	4.009		1.7260	3.375		1.0650	3.724		2.2400	3.7760		1.3240	4.1940		R	R	
Antimony	µg/m³	13,000	1.46	--	--	--	--	0.0084	0.0042	*	0.0075	0.0031	*	0.0075	0.0000	*	0.0075	0.0000	*	0.0072	0.0000	*	R	R	
Arsenic	µg/m³	2,500	0.000441	--	0.00045	--	0.19	**0.0364**	0.0573		**0.0064**	0.0124		**0.0101**	0.0353		**0.0042**	0.0071	J	**0.0099**	0.0313		R	R	
Barium	µg/m³	--	--	--	0.52	--	--	0.0549	0.0863	J	0.0203	0.0398		0.0147	0.0469	*	0.0165	0.0225	*	0.0111	0.0352		R	R	
Bismuth	µg/m³	--	--	--	--	--	--	NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA	
Bromine	µg/m³	--	--	--	--	--	--	0.0015	0.0013	*	0.0020	0.0040		0.0018	0.0063		0.0040	0.0067		0.0030	0.0094		R	R	
Cadmium	µg/m³	250	0.00105	--	0.0011	--	--	***0.006***	0.0031	*	***0.0051***	0.0004	*	***0.0054***	0.0018	*	0.0054	0.0003	*	***0.0051***	0.0000	*	R	R	
Calcium	µg/m³	--	--	--	--	--	--	2.0950	3.295		1.3160	2.573		0.8324	2.912		1.8370	3.0960		0.5970	1.8900		R	R	
Chlorine	µg/m³	--	--	--	--	--	--	0.0453	0.0712		0.0725	0.1417		0.0265	0.0927		0.3372	0.5683		0.0126	0.0000	*	R	R	
Chromium	µg/m³	100	0.000158	--	0.00016	--	--	**0.0060**	0.0095		**0.0023**	0.0044		***0.0018***	0.0041	*	**0.0033**	0.0056		***0.0012***	0.0031	*	R	R	
Cobalt	µg/m³	10,000	0.000686	--	0.00069	--	--	***0.0555***	0.0000	*	***0.0237***	0.0000	*	***0.0186***	0.0000	*	0.0282	0.0000	*	***0.0171***	0.0000	*	R	R	
Copper	µg/m³	--	--	--	--	--	100	1.4850	2.335		0.2053	0.4016		0.4632	1.620		0.3282	0.5531		0.4286	1.3570		R	R	
Gallium	µg/m³	--	--	--	--	--	--	0.0021	0.0000	*	0.0015	0.0000	*	0.0015	0.0000	*	0.0018	0.0000	*	0.0018	0.0000	*	R	R	
Germanium	µg/m³	--	--	--	--	--	--	0.0015	0.0000	*	0.0012	0.0000	*	0.0012	0.0000	*	0.0015	0.0000	*	0.0015	0.0000	*	R	R	
Indium	µg/m³	--	--	--	--	--	--	0.0063	0.0000	*	0.0057	0.0014	*	0.006	0.0035	*	0.006	0.0032	*	0.0057	0.0000	*	R	R	
Iron	µg/m³	--	--	--	--	--	--	3.0320	4.769		1.2110	2.368		0.9822	3.436		1.5290	2.5770		1.0040	3.1780		R	R	
Lanthanum	µg/m³	--	--	--	--	--	--	0.0675	0.0000	*	0.0267	0.0000	*	0.0234	0.0000	*	0.0276	0.0000	*	0.0162	0.0000	*	R	R	
Lead	µg/m³	--	--	1.5 [9,10,11]	--	1.5 [9,10,11]	--	0.0885	0.1392		0.0227	0.0444		0.0280	0.0978		0.0122	0.0206		0.0324	0.1026		R	R	
Magnesium	µg/m³	--	--	--	--	--	--	0.5532	0.8701		0.2727	0.5333		0.2758	0.9649		0.6808	1.1470		0.1264	0.4003		R	R	
Manganese	µg/m³	2,500	0.0521	--	0.051	--	--	0.0417	0.0656		0.0199	0.0390		0.0123	0.0430		0.0286	0.0482		0.0162	0.0513		R	R	
Mercury	µg/m³	1,000	0.313	--	0.31	--	1.8	0.0024	0.0000	*	0.0021	0.0000	*	0.0024	0.0000	*	0.0024	0.0000	*	0.0024	0.0000	*	R	R	
Molybdenum	µg/m³	--	--	--	--	--	--	0.0261	0.0410		0.0129	0.0252		0.0105	0.0366		0.0074	0.0125		0.0103	0.0325		R	R	
Nickel	µg/m³	5,000	0.0079	--	0.008	--	6	0.0027	0.0000	*	0.0021	0.0000	*	0.0024	0.0000	*	0.0024	0.0000	*	0.0024	0.0000	*	R	R	
Palladium	µg/m³	--	--	--	--	--	--	0.0054	0.0000	*	0.0048	0.0000	*	0.0048	0.0000	*	0.0051	0.0000	*	0.0048	0.0000	*	R	R	
Phosphorus	µg/m³	--	--	--	--	--	--	0.0177	0.0000	*	0.0132	0.0000	*	0.0117	0.0000	*	0.0147	0.0000	*	0.0057	0.0000	*	R	R	
Potassium	µg/m³	--	--	--	--	--	--	1.0890	1.713		0.6615	1.294		0.4370	1.529		0.7237	1.2200		0.5311	1.6820		R	R	
Rubidium	µg/m³	--	--	--	--	--	--	0.0015	0.0009	*	0.0016	0.0030		0.0012	0.0028	*	0.0039	0.0066		0.0015	0.0037	*	R	R	
Selenium	µg/m³	500	18.3	--	--	--	--	0.0051	0.0080	J	0.0012	0.0005	*	0.0012	0.0000	*	0.0015	0.0025		0.0012	0.0019	*	R	R	
Silicon	µg/m³	--	--	--	--	--	--	6.5960	10.37		4.3110	8.433		2.8060	9.816		5.1420	8.6650		3.0900	9.7840		R	R	
Silver	µg/m³	--	--	--	--	--	--	0.006	0.0042	*	0.0051	0.0017	*	0.0054	0.0087	*	0.0054	0.0000	*	0.0048	0.0000	*	R	R	
Sodium	µg/m³	--	--	--	--	--	--	0.2076	0.1003	*	0.1536	0.1084	*	0.1323	0.2380	*	0.546	0.6452	*	0.0681	0.1205	*	R	R	
Strontium	µg/m³	--	--	--	--	--	--	0.0103	0.0161		0.0084	0.0165		0.0048	0.0166		0.0115	0.0194		0.0045	0.0143		R	R	
Sulfur	µg/m³	--	--	--	--	--	--	0.9374	1.474		0.5843	1.143		0.6144	2.150		0.8894	1.4990		0.6408	2.0290		R	R	
Tin	µg/m³	--	--	--	--	--	--	0.0078	0.0027	*	0.0072	0.0038	*	0.0069	0.0000	*	0.0072	0.0043	*	0.0069	0.0000	*	R	R	
Titanium	µg/m³	--	--	--	31	--	--	0.3455	0.5435		0.1160	0.2268		0.0994	0.3479		0.1348	0.2273		0.0712	0.2254		R	R	
Vanadium	µg/m³	--	--	--	--	--	--	0.0144	0.0000	*	0.0054	0.0000	*	0.0048	0.0000	*	0.0051	0.0015	*	0.003	0.0000	*	R	R	
Yttrium	µg/m³	--	--	--	--	--	--	0.0021	0.0002	*	0.0018	0.0006	*	0.0018	0.0000	*	0.0018	0.0014	*	0.0018	0.0000	*	R	R	
Zinc	µg/m³	--	--	--	--	--	--	0.0691	0.1087		0.0160	0.0312		0.0178	0.0621		0.0215	0.0362		0.0318	0.1008		R	R	
Zirconium	µg/m³	--	--	--	--	--	--	0.0087	0.0136		0.0032	0.0062		0.0025	0.0089		0.0026	0.0044		0.0024	0.0055	*	R	R	

Table Notes:

[1] Arizona Department of Environmental Quality Acute and Chronic Ambient Air Concentrations, Title 18 Chapter 2 Article 17, December 2007
[2] Arizona Department of Environmental Quality Ambient Air Quality Standards, Title 18 Chapter 2 Article 2, December 2007
[3] EPA Region IX Preliminary Remediation Goals, Ambient Air, October 2004
[4] EPA National Ambient Air Quality Standards, http://www.epa.gov/air/criteria.html, February 2008
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[6] With the exception of arsenic, the averaging time for all listed analytes is one hour. The averaging time for arsenic is four hours.
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[8] The averaging time for the criteria is the annual arithmetic mean.
[9] The averaging time for the criteria is the quarterly average.
[10] Only the PM10 fraction is being measured not the total suspended particulates.
[11] On May 20, 2008, EPA proposed to revise the National Ambient Air Quality (NAAQS) for lead to within the range of 0.1-0.3 mg/m³.
[12] Percent of Total Mass
[13] Precipitation measurements are recorded manually by a Hayden-Winkelman High School employee; reliability cannot be verified.
[14] Bold values with bold outline indicate the result exceeds one or more of the comparison criteria.
[15] Bold italicized values indicate the non-detected result exceeds one or more of the comparison criteria.
[16] * = The result is less than three times the level of uncertainty which is shown in place of the result.
[17] -- = Not established
[18] ºC = Degrees Celsius
[19] % = Percent
[20] J = Estimated value
[21] mph = miles per hour
[22] NA = Not Applicable or Not analyzed
[23] NPR = No precipitation recorded.
[24] NV = Not valid
[25] µg/m³ = Micrograms per cubic meter
[26] PM_{10} = particulate matter with a diameter less than or equal to 10 microns in size
[27] R = Rejected
[28] This table should be considered preliminary and will be revised based on incoming data, final data validation and QA/QC.

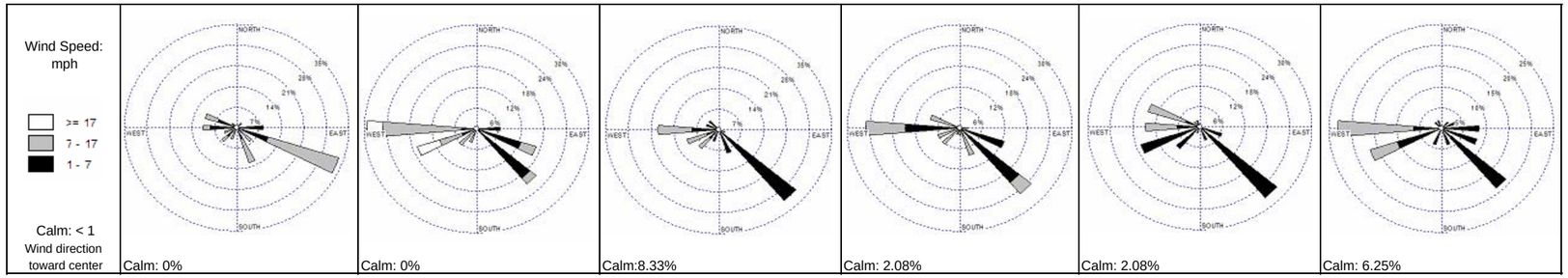

TABLE 4-31

PM_{10} Air Filter Sampling Laboratory Values for Inorganic Parameters

Hayden Monitoring Station

Remedial Investigation Report

ASARCO LLC Hayden, Arizona Plant Site

The data in this table are illustrated on figures 2-6, 4-55, 4-56, 4-57, 4-58, 4-59, and 4-60.

Date:		Arizona Hazardous Air Pollutants Ambient Air Concentrations (Acute)[1]	Arizona Hazardous Air Pollutants Ambient Air Concentrations (Chronic)[1]	Arizona Ambient Air Quality Standards[2]	EPA Region IX Preliminary Remediation Goal[3]	EPA National Ambient Air Quality Standards[4]	California Acute Reference Exposure Levels[5 6]	05/08/07			05/14/07			05/20/07			05/26/07			06/01/07			06/07/07		
Avg Wind Speed mph):								5.34			5.16			5.22			4.91			5.03			5.34		
Avg Wind Direction (degrees):								76			274			236			265			252			261		
Avg Ambient Temperature (ºC):								23.6			29.6			28.6			28.5			28.7			25.3		
Avg Ambient Relative Humidity (%):								9.8			5.6			8.9			5.9			5.8			6.6		
Precipitation (inches)[13]:								NPR			NPR			NPR			NPR			NPR			NPR		
Parameter	Units							Result	Percent[12]	Qual	Result	Percent[12]	Qual	Result	Percent[12]	Qual	Result	Percent[12]	Qual	Result	Percent[12]	Qual	Result	Percent[12]	Qual
PM_{10}	µg/m³	--	--	150 [7]/50 [8]	--	150 [7]	--	32.23	NA		45.75	NA		**50.34**	NA		**50.73**	NA		**91.48**	NA		**51.99**	NA	
Aluminum	µg/m³	--	--	--	5.1	--	--	0.6279	2.0960		1.6780	4.0260		1.7860	3.8930		2.1870	4.7170		4.1570	4.9960		1.9570	4.0910	
Antimony	µg/m³	13,000	1.46	--	--	--	--	0.0075	0.0000	*	0.0078	0.0000	*	0.0072	0.0000	*	0.0069	0.0051	*	0.0075	0.0038	*	0.0072	0.0000	*
Arsenic	µg/m³	2,500	0.000441	--	0.00045	--	0.19	**0.0244**	0.0816		**0.0105**	0.0253		**0.0056**	0.0122		**0.0098**	0.0212		**0.0150**	0.0180		***0.0021***	0.0006	*
Barium	µg/m³	--	--	--	0.52	--	--	0.0078	0.0114	*	0.0165	0.0396	J	0.0189	0.0317	*	0.0227	0.0489		0.0520	0.0625		0.0246	0.0514	
Bismuth	µg/m³	--	--	--	--	--	--	NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA	
Bromine	µg/m³	--	--	--	--	--	--	0.0012	0.0000	*	0.0076	0.0183		0.0037	0.0081		0.0036	0.0078		0.0060	0.0072		0.0052	0.0108	
Cadmium	µg/m³	250	0.00105	--	0.0011	--	--	***0.0057***	0.0164	*	***0.0057***	0.0015	*	***0.0054***	0.0045	*	***0.0048***	0.0000	*	***0.0051***	0.0007	*	***0.0048***	0.0028	*
Calcium	µg/m³	--	--	--	--	--	--	0.5957	1.9890		1.0500	2.5200		0.9106	1.9850		2.0900	4.5080		3.2310	3.8830		1.5980	3.3420	
Chlorine	µg/m³	--	--	--	--	--	--	0.0135	0.0256	*	0.2712	0.6508		0.0510	0.1112		0.2155	0.4646		0.1231	0.1479		0.8743	1.8280	
Chromium	µg/m³	100	0.000158	--	0.00016	--	--	**0.0017**	0.0058		**0.0020**	0.0048		***0.0015***	0.0030	*	**0.0025**	0.0055		**0.0072**	0.0087		***0.0018***	0.0018	*
Cobalt	µg/m³	10,000	0.000686	--	0.00069	--	--	***0.0177***	0.0000	*	***0.0213***	0.0000	*	***0.0255***	0.0000	*	***0.0348***	0.0000	*	***0.0705***	0.0000	*	***0.027***	0.0000	*
Copper	µg/m³	--	--	--	--	--	100	0.5700	1.9030		0.3118	0.7482		0.2345	0.5111		0.4364	0.9411		0.9963	1.1970		0.1353	0.2829	
Gallium	µg/m³	--	--	--	--	--	--	0.0018	0.0000	*	0.0015	0.0000	*	0.0015	0.0000	*	0.0015	0.0000	*	0.0021	0.0000	*	0.0015	0.0000	*
Germanium	µg/m³	--	--	--	--	--	--	0.0012	0.0000	*	0.0015	0.0000	*	0.0015	0.0000	*	0.0012	0.0000	*	0.0015	0.0000	*	0.0012	0.0000	*
Indium	µg/m³	--	--	--	--	--	--	0.0057	0.0000	*	0.006	0.0000	*	0.0057	0.0050	*	0.0051	0.0020	*	0.0057	0.0021	*	0.0054	0.0022	*
Iron	µg/m³	--	--	--	--	--	--	1.0160	3.3900		1.1540	2.7710		1.3840	3.0160		1.7150	3.6990		3.7490	4.5060		1.3990	2.9250	
Lanthanum	µg/m³	--	--	--	--	--	--	0.0126	0.0000	*	0.0243	0.0000	*	0.0315	0.0000	*	0.0195	0.0000	*	0.0372	0.0000	*	0.0177	0.0000	*
Lead	µg/m³	--	--	1.5 [9,10,11]	--	1.5 [9,10,11]	--	0.0774	0.2583		0.0257	0.0616		0.0127	0.0276		0.0253	0.0546		0.0460	0.0552		0.0048	0.0099	
Magnesium	µg/m³	--	--	--	--	--	--	0.1526	0.5092		0.2387	0.5729		0.3141	0.6847		0.2969	0.6402		0.7420	0.8918		0.5222	1.0920	
Manganese	µg/m³	2,500	0.0521	--	0.051	--	--	0.0095	0.0316		0.0310	0.0743		0.0318	0.0693		0.0332	0.0717		0.0487	0.0586		0.0255	0.0534	
Mercury	µg/m³	1,000	0.313	--	0.31	--	1.8	0.0024	0.0000	*	0.0024	0.0000	*	0.0024	0.0000	*	0.0024	0.0000	*	0.0027	0.0000	*	0.0024	0.0000	*
Molybdenum	µg/m³	--	--	--	--	--	--	0.0142	0.0473		0.0051	0.0123		0.0036	0.0051	*	0.0097	0.0209		0.0204	0.0245		0.0027	0.0000	*
Nickel	µg/m³	5,000	0.0079	--	0.008	--	6	0.0024	0.0000	*	0.0027	0.0006	*	0.0024	0.0000	*	0.0024	0.0000	*	0.0027	0.0000	*	0.0024	0.0000	*
Palladium	µg/m³	--	--	--	--	--	--	0.0051	0.0007	*	0.0054	0.0000	*	0.0051	0.0000	*	0.0042	0.0000	*	0.0048	0.0000	*	0.0045	0.0023	*
Phosphorus	µg/m³	--	--	--	--	--	--	0.0051	0.0000	*	0.0075	0.0000	*	0.0069	0.0000	*	0.0111	0.0000	*	0.0153	0.0000	*	0.0102	0.0000	*
Potassium	µg/m³	--	--	--	--	--	--	0.2077	0.6934		0.7385	1.7720		0.7835	1.7080		0.9680	2.0870		1.7630	2.1190		0.7472	1.5620	
Rubidium	µg/m³	--	--	--	--	--	--	0.0012	0.0000	*	0.0030	0.0071		0.0054	0.0117		0.0038	0.0082		0.0095	0.0114		0.0032	0.0067	
Selenium	µg/m³	500	18.3	--	--	--	--	0.0041	0.0136		0.0020	0.0048		0.0012	0.0023	*	0.0009	0.0019	*	0.0031	0.0037		0.0009	0.0000	*
Silicon	µg/m³	--	--	--	--	--	--	1.6050	5.3570		4.4120	10.5900		3.6900	8.0440		4.5690	9.8520		9.2570	11.1200		4.3660	9.1270	
Silver	µg/m³	--	--	--	--	--	--	0.0051	0.0000	*	0.0054	0.0017	*	0.0051	0.0000	*	0.0045	0.0019	*	0.0051	0.0011	*	0.0048	0.0058	*
Sodium	µg/m³	--	--	--	--	--	--	0.1737	0.5481	*	0.3954	0.9490		0.2121	0.3538	*	0.5796	0.9117	*	0.8313	0.5099	*	0.6546	1.3600	*
Strontium	µg/m³	--	--	--	--	--	--	0.0035	0.0116		0.0084	0.0202		0.0058	0.0127		0.0099	0.0213		0.0157	0.0189		0.0103	0.0216	
Sulfur	µg/m³	--	--	--	--	--	--	0.6443	2.1510		0.9120	2.1890		0.8927	1.9460		1.2860	2.7730		1.7760	2.1340		0.7689	1.6070	
Tin	µg/m³	--	--	--	--	--	--	0.0072	0.0074	*	0.0078	0.0122	*	0.0072	0.0061	*	0.0066	0.0064	*	0.0069	0.0000	*	0.0069	0.0062	*
Titanium	µg/m³	--	--	--	31	--	--	0.0495	0.1653		0.1146	0.2749		0.1599	0.3486		0.1416	0.3053		0.2994	0.3599		0.1257	0.2628	
Vanadium	µg/m³	--	--	--	--	--	--	0.0021	0.0000	*	0.0045	0.0011	*	0.006	0.0040	*	0.0066	0.0000	*	0.0132	0.0000	*	0.006	0.0000	*
Yttrium	µg/m³	--	--	--	--	--	--	0.0018	0.0013	*	0.0018	0.0009	*	0.0018	0.0020	*	0.0015	0.0014	*	0.0028	0.0034		0.0015	0.0000	*
Zinc	µg/m³	--	--	--	--	--	--	0.0909	0.3036		0.0328	0.0788		0.0119	0.0259		0.0318	0.0685		0.0693	0.0832		0.0073	0.0154	
Zirconium	µg/m³	--	--	--	--	--	--	0.0024	0.0071	*	0.0042	0.0101		0.0040	0.0088		0.0042	0.0091		0.0103	0.0124		0.0041	0.0087	

Table Notes:

[1] Arizona Department of Environmental Quality Acute and Chronic Ambient Air Concentrations, Title 18 Chapter 2 Article 17, December 2007
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[13] Precipitation measurements are recorded manually by a Hayden-Winkelman High School employee; reliability cannot be verified.
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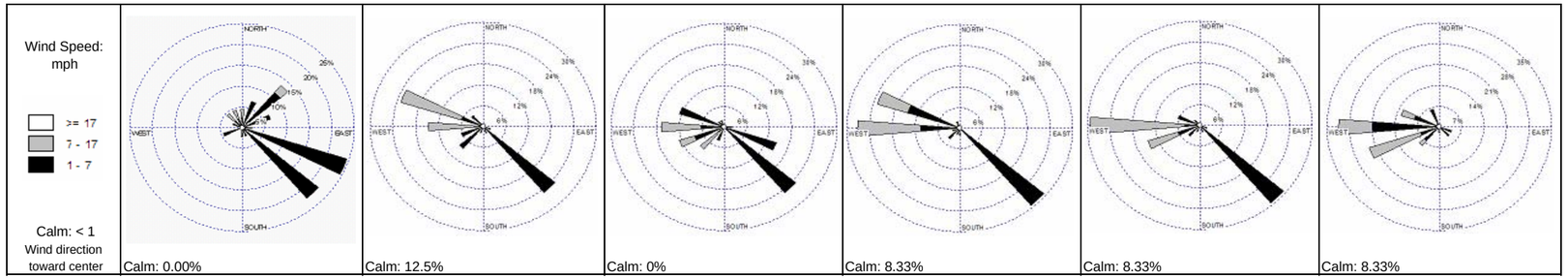

TABLE 4-31

PM_{10} Air Filter Sampling Laboratory Values for Inorganic Parameters

Hayden Monitoring Station

Remedial Investigation Report

ASARCO LLC Hayden, Arizona Plant Site

The data in this table are illustrated on figures 2-6, 4-55, 4-56, 4-57, 4-58, 4-59, and 4-60.

Date:		Arizona Hazardous Air Pollutants Ambient Air Concentrations (Acute)[1]	Arizona Hazardous Air Pollutants Ambient Air Concentrations (Chronic)[1]	Arizona Ambient Air Quality Standards[2]	EPA Region IX Preliminary Remediation Goal[3]	EPA National Ambient Air Quality Standards[4]	California Acute Reference Exposure Levels[5 6]	06/13/07			06/19/07			06/25/07			07/01/07			07/07/07			07/13/07		
Avg Wind Speed mph):								4.29			4.66			4.16			5.22			6.28			5.28		
Avg Wind Direction (degrees):								251			274			261			262			340			260		
Avg Ambient Temperature (ºC):								29.4			32.7			32.6			33.9			35.2			34.1		
Avg Ambient Relative Humidity (%):								12.1			5.4			5.3			5.2			6.3			10.5		
Precipitation (inches)[13]:								NPR			NPR			NPR			NPR			NPR			NPR		
Parameter	**Units**							**Result**	**Percent[12]**	**Qual**	**Result**	**Percent[12]**	**Qual**	**Result**	**Percent[12]**	**Qual**	**Result**	**Percent[12]**	**Qual**	**Result**	**Percent[12]**	**Qual**	**Result**	**Percent[12]**	**Qual**
PM_{10}	µg/m³	--	--	150 [7]/50 [8]	--	150 [7]	--	**51.31**	NA		**57.51**	NA		47.90	NA		**69.08**	NA		R	NA		35.27	NA	
Aluminum	µg/m³	--	--	--	5.1	--	--	1.3310	2.8410		2.0910	4.0210		1.7830	4.1270		2.5000	4.0300		R	R		1.1940	3.7610	
Antimony	µg/m³	13,000	1.46	--	--	--	--	0.0066	0.0047	*	0.0069	0.0000	*	0.009	0.0000	*	0.0093	0.0039	*	R	R		0.0081	0.0034	*
Arsenic	µg/m³	2,500	0.000441	--	0.00045	--	0.19	**0.0057**	0.0122		**0.0102**	0.0196		**0.0126**	0.0291		**0.0110**	0.0178		R	R		**0.0049**	0.0154	
Barium	µg/m³	--	--	--	0.52	--	--	0.0113	0.0241		0.0156	0.0283	*	0.0105	0.0233	*	0.0195	0.0314		R	R		0.0132	0.0399	*
Bismuth	µg/m³	--	--	--	--	--	--	NA	NA		NA	NA		NA	NA		NA	NA		R	R		NA	NA	
Bromine	µg/m³	--	--	--	--	--	--	0.0023	0.0048		0.0017	0.0033		0.0028	0.0064		0.0066	0.0107		R	R		0.0051	0.0162	
Cadmium	µg/m³	250	0.00105	--	0.0011	--	--	***0.0045***	0.0045	*	***0.0048***	0.0024	*	***0.0066***	0.0011	*	***0.0069***	0.0000	*	R	R		***0.0054***	0.0006	*
Calcium	µg/m³	--	--	--	--	--	--	1.1510	2.4580		1.6040	3.0840		1.1180	2.5870		1.8690	3.0120		R	R		1.0930	3.4420	
Chlorine	µg/m³	--	--	--	--	--	--	0.0519	0.1108		0.2062	0.3965		0.2219	0.5135		0.1459	0.2352		R	R		0.0468	0.1474	
Chromium	µg/m³	100	0.000158	--	0.00016	--	--	***0.0012***	0.0025	*	**0.0025**	0.0049		**0.0023**	0.0052		**0.0024**	0.0039	J	R	R		***0.0012***	0.0004	*
Cobalt	µg/m³	10,000	0.000686	--	0.00069	--	--	***0.0276***	0.0000	*	***0.0288***	0.0000	*	***0.0228***	0.0000	*	***0.0366***	0.0000	*	R	R		***0.0171***	0.0000	*
Copper	µg/m³	--	--	--	--	--	100	0.8630	1.8430		0.4633	0.8910		0.5170	1.1960		0.7486	1.2070		R	R		0.2245	0.7071	
Gallium	µg/m³	--	--	--	--	--	--	0.0015	0.0000	*	0.0018	0.0000	*	0.0015	0.0000	*	0.0015	0.0000	*	R	R		0.0015	0.0000	*
Germanium	µg/m³	--	--	--	--	--	--	0.0012	0.0000	*	0.0012	0.0000	*	0.0012	0.0000	*	0.0012	0.0000	*	R	R		0.0012	0.0000	*
Indium	µg/m³	--	--	--	--	--	--	0.0051	0.0000	*	0.0051	0.0000	*	0.0072	0.0000	*	0.0078	0.0026	*	R	R		0.0063	0.0087	*
Iron	µg/m³	--	--	--	--	--	--	1.3620	2.9070		1.4200	2.7310		1.1250	2.6040		1.9540	3.1500		R	R		0.8725	2.7480	
Lanthanum	µg/m³	--	--	--	--	--	--	0.0108	0.0000	*	0.0168	0.0000	*	0.0114	0.0000	*	0.0195	0.0000	*	R	R		0.0213	0.0000	*
Lead	µg/m³	--	--	1.5 [9,10,11]	--	1.5 [9,10,11]	--	0.0238	0.0508		0.0298	0.0573		0.0299	0.0692		0.0382	0.0615		R	R		0.0210	0.0660	
Magnesium	µg/m³	--	--	--	--	--	--	0.1994	0.4259		0.3055	0.5875		0.1162	0.2688		0.2441	0.3935		R	R		0.2192	0.6903	
Manganese	µg/m³	2,500	0.0521	--	0.051	--	--	0.0164	0.0351		0.0252	0.0485		0.0169	0.0390		0.0256	0.0413		R	R		0.0148	0.0467	
Mercury	µg/m³	1,000	0.313	--	0.31	--	1.8	0.0021	0.0000	*	0.0024	0.0000	*	0.0021	0.0000	*	0.0021	0.0000	*	R	R		0.0024	0.0000	*
Molybdenum	µg/m³	--	--	--	--	--	--	0.0140	0.0300		0.0065	0.0124		0.0066	0.0153		0.0157	0.0253		R	R		0.0033	0.0062	*
Nickel	µg/m³	5,000	0.0079	--	0.008	--	6	0.0021	0.0000	*	0.0024	0.0000	*	0.0018	0.0012	*	0.0021	0.0000	*	R	R		0.0024	0.0000	*
Palladium	µg/m³	--	--	--	--	--	--	0.0042	0.0025	*	0.0042	0.0000	*	0.0063	0.0000	*	0.0066	0.0000	*	R	R		0.0054	0.0018	*
Phosphorus	µg/m³	--	--	--	--	--	--	0.0048	0.0000	*	0.006	0.0000	*	0.0063	0.0000	*	0.0078	0.0000	*	R	R		0.0084	0.0000	*
Potassium	µg/m³	--	--	--	--	--	--	0.6003	1.2820		0.9544	1.8350		0.9803	2.2690		1.2800	2.0630		R	R		0.6827	2.1500	
Rubidium	µg/m³	--	--	--	--	--	--	0.0021	0.0045		0.0038	0.0073		0.0016	0.0038		0.0054	0.0087		R	R		0.0016	0.0049	
Selenium	µg/m³	500	18.3	--	--	--	--	0.0025	0.0053		0.0019	0.0036		0.0028	0.0064		0.0018	0.0029		R	R		0.0030	0.0093	
Silicon	µg/m³	--	--	--	--	--	--	2.7280	5.8260		5.3860	10.3600		4.2390	9.8100		6.2530	10.0800		R	R		2.8260	8.9010	
Silver	µg/m³	--	--	--	--	--	--	0.0045	0.0000	*	0.0048	0.0036	*	0.0066	0.0082	*	0.0069	0.0034	*	R	R		0.0057	0.0095	*
Sodium	µg/m³	--	--	--	--	--	--	0.2424	0.2720	*	0.2748	0.3045	*	0.4551	1.0530		0.5320	0.8576		R	R		0.2643	0.6147	*
Strontium	µg/m³	--	--	--	--	--	--	0.0045	0.0097		0.0084	0.0162		0.0062	0.0144		0.0101	0.0162		R	R		0.0056	0.0178	
Sulfur	µg/m³	--	--	--	--	--	--	1.1830	2.5260		1.2030	2.3130		0.8517	1.9710		1.1380	1.8340		R	R		0.7274	2.2910	
Tin	µg/m³	--	--	--	--	--	--	0.0066	0.0004	*	0.0066	0.0000	*	0.0081	0.0000	*	0.0084	0.0000	*	R	R		0.0078	0.0117	*
Titanium	µg/m³	--	--	--	31	--	--	0.0767	0.1639		0.1336	0.2570		0.0826	0.1911		0.1552	0.2501		R	R		0.0985	0.3101	
Vanadium	µg/m³	--	--	--	--	--	--	0.0036	0.0000	*	0.0057	0.0000	*	0.0039	0.0011	*	0.0066	0.0010	*	R	R		0.0039	0.0000	*
Yttrium	µg/m³	--	--	--	--	--	--	0.0015	0.0000	*	0.0015	0.0021	*	0.0012	0.0000	*	0.0015	0.0024		R	R		0.0018	0.0018	*
Zinc	µg/m³	--	--	--	--	--	--	0.0292	0.0623		0.0300	0.0578		0.0361	0.0836		0.0772	0.1244		R	R		0.0285	0.0899	
Zirconium	µg/m³	--	--	--	--	--	--	0.0020	0.0042		0.0059	0.0114		0.0026	0.0060		0.0047	0.0076		R	R		0.0027	0.0085	

Table Notes:

[1] Arizona Department of Environmental Quality Acute and Chronic Ambient Air Concentrations, Title 18 Chapter 2 Article 17, December 2007
[2] Arizona Department of Environmental Quality Ambient Air Quality Standards, Title 18 Chapter 2 Article 2, December 2007
[3] EPA Region IX Preliminary Remediation Goals, Ambient Air, October 2004
[4] EPA National Ambient Air Quality Standards, http://www.epa.gov/air/criteria.html, February 2008
[5] California Acute Reference Exposure Levels, March 1999
[6] With the exception of arsenic, the averaging time for all listed analytes is one hour. The averaging time for arsenic is four hours.
[7] The averaging time for the criteria is 24 hours.
[8] The averaging time for the criteria is the annual arithmetic mean.
[9] The averaging time for the criteria is the quarterly average.
[10] Only the PM10 fraction is being measured not the total suspended particulates.
[11] On May 20, 2008, EPA proposed to revise the National Ambient Air Quality (NAAQS) for lead to within the range of 0.1-0.3 mg/m³.
[12] Percent of Total Mass
[13] Precipitation measurements are recorded manually by a Hayden-Winkelman High School employee; reliability cannot be verified.
[14] Bold values with bold outline indicate the result exceeds one or more of the comparison criteria.
[15] Bold italicized values indicate the non-detected result exceeds one or more of the comparison criteria.
[16] * = The result is less than three times the level of uncertainty which is shown in place of the result.
[17] -- = Not established
[18] ºC = Degrees Celsius
[19] % = Percent
[20] J = Estimated value
[21] mph = miles per hour
[22] NA = Not Applicable or Not analyzed
[23] NPR = No precipitation recorded.
[24] NV = Not valid
[25] µg/m³ = Micrograms per cubic meter
[26] PM_{10} = particulate matter with a diameter less than or equal to 10 microns in size
[27] R = Rejected
[28] This table should be considered preliminary and will be revised based on incoming data, final data validation and QA/QC.

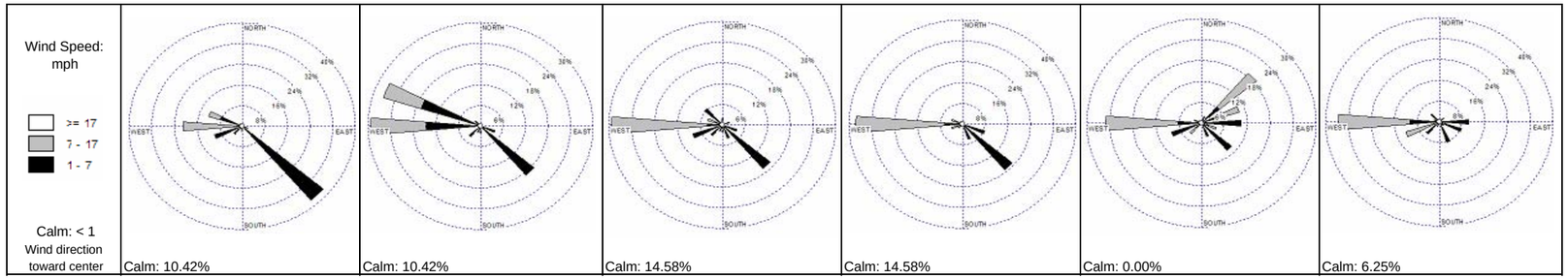

TABLE 4-31

PM_{10} Air Filter Sampling Laboratory Values for Inorganic Parameters

Hayden Monitoring Station

Remedial Investigation Report

ASARCO LLC Hayden, Arizona Plant Site

The data in this table are illustrated on figures 2-6, 4-55, 4-56, 4-57, 4-58, 4-59, and 4-60.

Date:		Arizona Hazardous Air Pollutants Ambient Air Concentrations (Acute)[1]	Arizona Hazardous Air Pollutants Ambient Air Concentrations (Chronic)[1]	Arizona Ambient Air Quality Standards[2]	EPA Region IX Preliminary Remediation Goal[3]	EPA National Ambient Air Quality Standards[4]	California Acute Reference Exposure Levels[5 6]	07/19/07			07/25/07			07/31/07			08/06/07			08/12/07			08/18/07		
Avg Wind Speed mph):								7.02			4.10			4.78			4.97			4.41			3.98		
Avg Wind Direction (degrees):								247			239			255			274			139			121		
Avg Ambient Temperature (ºC):								34.3			27.3			28.3			25.5			34.1			32.7		
Avg Ambient Relative Humidity (%):								9.8			30.3			25.7			36.4			11.7			11.5		
Precipitation (inches)[13]:								NPR			NPR			NPR			NPR			NPR			NPR		
Parameter	Units							Result	Percent[12]	Qual	Result	Percent[12]	Qual	Result	Percent[12]	Qual	Result	Percent[12]	Qual	Result	Percent[12]	Qual	Result	Percent[12]	Qual
PM_{10}	µg/m³	--	--	150 [7]/50 [8]	--	150 [7]	--	46.16	NA		25.20	NA		19.49	NA		9.78	NA		39.68	NA		45.27	NA	
Aluminum	µg/m³	--	--	--	5.1	--	--	1.6620	4.0250		0.7628	3.2920		0.6606	3.7040		0.1320	1.4600		1.0760	3.0180		1.1180	2.7460	
Antimony	µg/m³	13,000	1.46	--	--	--	--	0.0078	0.0002	*	0.0078	0.0132	*	0.0075	0.0063	*	0.0078	0.0255	*	0.0084	0.0054	*	0.0084	0.0037	*
Arsenic	µg/m³	2,500	0.000441	--	0.00045	--	0.19	***0.0093***	0.0196	*	**0.0044**	0.0191		**0.0054**	0.0301		***0.0036***	0.0354	*	**0.0102**	0.0286		**0.0139**	0.0341	
Barium	µg/m³	--	--	--	0.52	--	--	0.0252	0.0611		0.0093	0.0228	*	0.0075	0.0008	*	0.0042	0.0000	*	0.0145	0.0408		0.0117	0.0184	*
Bismuth	µg/m³	--	--	--	--	--	--	0.0154	0.0374		NA	NA		0.0034	0.019		NA	NA		0.0038	0.0107		0.0105	0.0257	
Bromine	µg/m³	--	--	--	--	--	--	0.0020	0.0049		0.0009	0.0035	*	0.0015	0.0082		0.0009	0.0000	*	0.0009	0.0013	*	0.0019	0.0046	
Cadmium	µg/m³	250	0.00105	--	0.0011	--	--	***0.0054***	0.0000	*	***0.0054***	0.0000	*	***0.0051***	0.0029	*	***0.0054***	0.0130	*	***0.0057***	0.0055	*	***0.006***	0.0121	*
Calcium	µg/m³	--	--	--	--	--	--	1.1570	2.8030		0.7223	3.1180		0.4542	2.5470		0.2403	2.6580		1.0040	2.8140		0.7788	1.9130	
Chlorine	µg/m³	--	--	--	--	--	--	0.0123	0.0298		0.0084	0.0364		0.0066	0.0000	*	0.0057	0.0479	*	0.0084	0.0000	*	0.012	0.0000	*
Chromium	µg/m³	100	0.000158	--	0.00016	--	--	**0.0034**	0.0083		**0.0028**	0.0120		***0.0009***	0.0037	*	***0.0009***	0.0000	*	**0.0016**	0.0045		**0.0015**	0.0036	
Cobalt	µg/m³	10,000	0.000686	--	0.00069	--	--	***0.0279***	0.0000	*	***0.0141***	0.0000	*	***0.0117***	0.0000	*	***0.0036***	0.0000	*	***0.0189***	0.0000	*	***0.0192***	0.0000	*
Copper	µg/m³	--	--	--	--	--	100	0.5659	1.3710		0.2129	0.9190		0.1842	1.0330		0.0864	0.9556		0.4335	1.2150		0.4906	1.2050	
Gallium	µg/m³	--	--	--	--	--	--	0.0021	0.0000	*	0.0015	0.0000	*	0.0015	0.0000	*	0.0015	0.0000	*	0.0015	0.0000	*	0.0015	0.0000	*
Germanium	µg/m³	--	--	--	--	--	--	0.0012	0.0000	*	0.0012	0.0000	*	0.0012	0.0000	*	0.0012	0.0000	*	0.0012	0.0000	*	0.0012	0.0000	*
Indium	µg/m³	--	--	--	--	--	--	0.0063	0.0072	*	0.006	0.0000	*	0.0057	0.0092	*	0.0063	0.0286	*	0.0066	0.0000	*	0.0063	0.0000	*
Iron	µg/m³	--	--	--	--	--	--	1.5150	3.6690		0.7147	3.0850		0.5843	3.2760		0.1322	1.4620		0.9520	2.6690		1.0340	2.5400	
Lanthanum	µg/m³	--	--	--	--	--	--	0.0294	0.0000	*	0.015	0.0000	*	0.0126	0.0190	*	0.0054	0.0000	*	0.0192	0.0000	*	0.0192	0.0000	*
Lead	µg/m³	--	--	1.5 [9,10,11]	--	1.5 [9,10,11]	--	0.0986	0.2388		0.0136	0.0585		0.0208	0.1164		0.0142	0.1567		0.0268	0.0752		0.0429	0.1055	
Magnesium	µg/m³	--	--	--	--	--	--	0.3351	0.8116		0.1540	0.6646		0.1216	0.6817		0.0354	0.3322	*	0.2494	0.6994		0.1977	0.4857	
Manganese	µg/m³	2,500	0.0521	--	0.051	--	--	0.0266	0.0645		0.0108	0.0465		0.0089	0.0496		0.0015	0.0161		0.0147	0.0412		0.0142	0.0349	
Mercury	µg/m³	1,000	0.313	--	0.31	--	1.8	0.0024	0.0000	*	0.0024	0.0000	*	0.0024	0.0000	*	0.0024	0.0000	*	0.0024	0.0000	*	0.0024	0.0000	*
Molybdenum	µg/m³	--	--	--	--	--	--	0.0085	0.0206		0.0046	0.0199		0.003	0.0116	*	0.0027	0.0109	*	0.0089	0.0249		0.0119	0.0293	
Nickel	µg/m³	5,000	0.0079	--	0.008	--	6	0.0024	0.0000	*	0.0021	0.0000	*	0.0021	0.0000	*	0.0021	0.0005	*	0.0021	0.0000	*	0.0024	0.0000	*
Palladium	µg/m³	--	--	--	--	--	--	0.0054	0.0000	*	0.0051	0.0055	*	0.0048	0.0029	*	0.0054	0.0000	*	0.0057	0.0055	*	0.0054	0.0000	*
Phosphorus	µg/m³	--	--	--	--	--	--	0.0096	0.0000	*	0.0057	0.0000	*	0.0054	0.0000	*	0.0036	0.0000	*	0.0054	0.0000	*	0.0063	0.0000	*
Potassium	µg/m³	--	--	--	--	--	--	0.8461	2.0490		0.3917	1.6910		0.2931	1.6440		0.0794	0.8785		0.5382	1.5090		0.6111	1.5010	
Rubidium	µg/m³	--	--	--	--	--	--	0.0044	0.0106		0.0016	0.0069		0.0012	0.0053	*	0.0012	0.0000	*	0.0018	0.0050		0.0034	0.0083	
Selenium	µg/m³	500	18.3	--	--	--	--	0.0051	0.0124		0.0033	0.0142		0.0023	0.0127		0.0073	0.0812		0.0035	0.0098		0.0115	0.0282	
Silicon	µg/m³	--	--	--	--	--	--	3.8180	9.2480		1.8630	8.0400		1.5170	8.5040		0.3292	3.6400		2.6270	7.3660		2.8490	6.9970	
Silver	µg/m³	--	--	--	--	--	--	0.0057	0.0000	*	0.0054	0.0116	*	0.0051	0.0000	*	0.0054	0.0146	*	0.0057	0.0032	*	0.006	0.0098	*
Sodium	µg/m³	--	--	--	--	--	--	0.3126	0.6299	*	0.1596	0.5075	*	0.15	0.3815	*	0.1232	1.3630		0.1905	0.5224	*	0.1977	0.2230	*
Strontium	µg/m³	--	--	--	--	--	--	0.0074	0.0180		0.0024	0.0104		0.0027	0.0153		0.0012	0.0057	*	0.0041	0.0116		0.0041	0.0101	
Sulfur	µg/m³	--	--	--	--	--	--	0.9596	2.3240		0.5052	2.1810		0.6940	3.8920		0.4718	5.2180		0.9930	2.7840		1.9150	4.7040	
Tin	µg/m³	--	--	--	--	--	--	0.0078	0.0065	*	0.0075	0.0126	*	0.0069	0.0000	*	0.0072	0.0000	*	0.0081	0.0044	*	0.0081	0.0045	*
Titanium	µg/m³	--	--	--	31	--	--	0.1455	0.3523		0.0648	0.2799		0.0502	0.2814		0.0100	0.1104		0.0858	0.2407		0.0890	0.2187	
Vanadium	µg/m³	--	--	--	--	--	--	0.0057	0.0000	*	0.0027	0.0000	*	0.0021	0.0000	*	0.0009	0.0036	*	0.0036	0.0000	*	0.0036	0.0000	*
Yttrium	µg/m³	--	--	--	--	--	--	0.0018	0.0005	*	0.0018	0.0014	*	0.0015	0.0000	*	0.0015	0.0000	*	0.0018	0.0036	*	0.0018	0.0003	*
Zinc	µg/m³	--	--	--	--	--	--	0.0678	0.1643		0.0195	0.0843		0.0222	0.1246		0.0100	0.1109		0.0218	0.0611		0.0364	0.0894	
Zirconium	µg/m³	--	--	--	--	--	--	0.0023	0.0056		0.0021	0.0045	*	0.0021	0.0090	*	0.0021	0.0104	*	0.0031	0.0086		0.0021	0.0042	*

Table Notes:

[1] Arizona Department of Environmental Quality Acute and Chronic Ambient Air Concentrations, Title 18 Chapter 2 Article 17, December 2007
[2] Arizona Department of Environmental Quality Ambient Air Quality Standards, Title 18 Chapter 2 Article 2, December 2007
[3] EPA Region IX Preliminary Remediation Goals, Ambient Air, October 2004
[4] EPA National Ambient Air Quality Standards, http://www.epa.gov/air/criteria.html, February 2008
[5] California Acute Reference Exposure Levels, March 1999
[6] With the exception of arsenic, the averaging time for all listed analytes is one hour. The averaging time for arsenic is four hours.
[7] The averaging time for the criteria is 24 hours.
[8] The averaging time for the criteria is the annual arithmetic mean.
[9] The averaging time for the criteria is the quarterly average.
[10] Only the PM10 fraction is being measured not the total suspended particulates.
[11] On May 20, 2008, EPA proposed to revise the National Ambient Air Quality (NAAQS) for lead to within the range of 0.1-0.3 mg/m³.
[12] Percent of Total Mass
[13] Precipitation measurements are recorded manually by a Hayden-Winkelman High School employee; reliability cannot be verified.
[14] Bold values with bold outline indicate the result exceeds one or more of the comparison criteria.
[15] Bold italicized values indicate the non-detected result exceeds one or more of the comparison criteria.
[16] * = The result is less than three times the level of uncertainty which is shown in place of the result.
[17] -- = Not established
[18] ºC = Degrees Celsius
[19] % = Percent
[20] J = Estimated value
[21] mph = miles per hour
[22] NA = Not Applicable or Not analyzed
[23] NPR = No precipitation recorded.
[24] NV = Not valid
[25] µg/m³ = Micrograms per cubic meter
[26] PM_{10} = particulate matter with a diameter less than or equal to 10 microns in size
[27] R = Rejected
[28] This table should be considered preliminary and will be revised based on incoming data, final data validation and QA/QC.

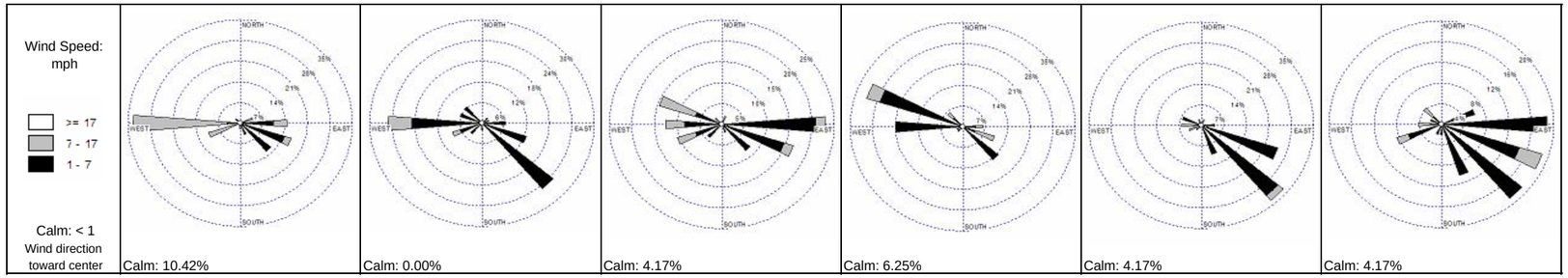

TABLE 4-31

PM_{10} Air Filter Sampling Laboratory Values for Inorganic Parameters

Hayden Monitoring Station

Remedial Investigation Report

ASARCO LLC Hayden, Arizona Plant Site

The data in this table are illustrated on figures 2-6, 4-55, 4-56, 4-57, 4-58, 4-59, and 4-60.

Date:								08/24/07			08/30/07			09/05/07			09/11/07			09/17/07			9/23/2007		
Avg Wind Speed mph):								4.60			7.83			3.79			8.76			6.65			5.28		
Avg Wind Direction (degrees):								132			64			218			54			206			281		
Avg Ambient Temperature (ºC):								32.7			35.4			30.8			32.8			28.3			25.3		
Avg Ambient Relative Humidity (%):								12.7			5.3			9.9			5.9			12.2			12.2		
Precipitation (inches)[13]:								NPR			NPR			NPR			NPR			9/14 - 0.42			NPR		
Parameter	**Units**	**Arizona Hazardous Air Pollutants Ambient Air Concentrations (Acute)[1]**	**Arizona Hazardous Air Pollutants Ambient Air Concentrations (Chronic)[1]**	**Arizona Ambient Air Quality Standards[2]**	**EPA Region IX Preliminary Remediation Goal[3]**	**EPA National Ambient Air Quality Standards[4]**	**California Acute Reference Exposure Levels[5 6]**	**Result**	**Percent[12]**	**Qual**	**Result**	**Percent[12]**	**Qual**	**Result**	**Percent[12]**	**Qual**	**Result**	**Percent[12]**	**Qual**	**Result**	**Percent[12]**	**Qual**	**Result**	**Percent[12]**	**Qual**
PM_{10}	µg/m³	--	--	150 [7]/50 [8]	--	150 [7]	--	32.48	NA		39.05	NA		48.19	NA		44.89	NA		45.13	NA		17.65	NA	
Aluminum	µg/m³	--	--	--	5.1	--	--	1.0210	3.4950		0.2979	0.8513		1.7140	3.9370		0.6272	1.5450		1.7720	4.2920		0.3987	2.4470	
Antimony	µg/m³	13,000	1.46	--	--	--	--	0.0081	0.0000	*	0.0102	0.0291		0.0072	0.0000	*	0.0120	0.0296	J	0.0075	0.0034	*	0.003	0.0104	*
Arsenic	µg/m³	2,500	0.000441	--	0.00045	--	0.19	**0.0080**	0.0274		**0.1794**	0.5127		**0.0071**	0.0163		**0.1894**	0.4667		**0.0251**	0.0608		***0.0015***	0.0098	*
Barium	µg/m³	--	--	--	0.52	--	--	0.0108	0.0316	*	0.0287	0.0821		0.0129	0.0066	*	0.0403	0.0993		0.0123	0.0185	*	0.0051	0.0000	*
Bismuth	µg/m³	--	--	--	--	--	--	NA	NA		0.2586	0.7389		0.0085	0.0196		0.2621	0.6459		0.021	0.0509		NA	NA	
Bromine	µg/m³	--	--	--	--	--	--	0.0012	0.0042		0.0012	0.0000	*	0.0017	0.0040		0.0015	0.0000	*	0.0009	0.0025	*	0.0019	0.0118	
Cadmium	µg/m³	250	0.00105	--	0.0011	--	--	***0.0057***	0.0000	*	**0.0351**	0.1002		***0.0054***	0.0005	*	**0.0324**	0.0798		***0.0057***	0.0078	*	***0.0021***	0.0000	*
Calcium	µg/m³	--	--	--	--	--	--	0.5697	1.9500		0.5843	1.6690		1.5600	3.5840		1.0470	2.5800		0.8178	1.9810		0.3463	2.1260	
Chlorine	µg/m³	--	--	--	--	--	--	0.0072	0.0000	*	0.0129	0.0000	*	0.012	0.0000	*	0.0147	0.0000	*	0.1645	0.3984		0.2717	1.6680	
Chromium	µg/m³	100	0.000158	--	0.00016	--	--	***0.0012***	0.0026	*	**0.0025**	0.0073		***0.0021***	0.0032	*	***0.0021***	0.0039	*	***0.0021***	0.0015	*	***0.0009***	0.0000	*
Cobalt	µg/m³	10,000	0.000686	--	0.00069	--	--	***0.0156***	0.0000	*	***0.0042***	0.0000	*	***0.0045***	0.0000	*	***0.0051***	0.0000	*	***0.0039***	0.0000	*	***0.0075***	0.0000	*
Copper	µg/m³	--	--	--	--	--	100	0.3154	1.0800		3.6770	10.5000		0.6116	1.4050		3.6970	9.1100		0.3699	0.8958		0.0553	0.3393	
Gallium	µg/m³	--	--	--	--	--	--	0.0015	0.0000	*	0.0021	0.0000	*	0.0015	0.0000	*	0.0024	0.0000	*	0.0015	0.0000	*	0.0012	0.0000	*
Germanium	µg/m³	--	--	--	--	--	--	0.0012	0.0000	*	0.0015	0.0000	*	0.0012	0.0000	*	0.0015	0.0000	*	0.0012	0.0000	*	0.0009	0.0000	*
Indium	µg/m³	--	--	--	--	--	--	0.0063	0.0000	*	0.0066	0.0032	*	0.0057	0.0012	*	0.0069	0.0000	*	0.006	0.0000	*	0.0024	0.0000	*
Iron	µg/m³	--	--	--	--	--	--	0.8343	2.8560		1.3280	3.7940		2.0250	4.6500		2.6850	6.6160		1.4580	3.5310		0.3686	2.2630	
Lanthanum	µg/m³	--	--	--	--	--	--	0.0174	0.0000	*	0.0117	0.0000	*	0.012	0.0000	*	0.012	0.0000	*	0.0111	0.0000	*	0.0057	0.0029	*
Lead	µg/m³	--	--	1.5 [9,10,11]	--	1.5 [9,10,11]	--	0.0182	0.0622		0.5170	1.4770		0.0294	0.0676		0.8362	2.0600		0.0803	0.1945		0.0033	0.0205	
Magnesium	µg/m³	--	--	--	--	--	--	0.1416	0.4849		0.0315	0.0000	*	0.1972	0.4530		0.0381	0.0000	*	0.0396	0.0806	*	0.0650	0.3988	
Manganese	µg/m³	2,500	0.0521	--	0.051	--	--	0.0149	0.0509		0.0072	0.0204		0.0344	0.0790		0.0193	0.0475	J	0.0328	0.0794		0.0045	0.0275	
Mercury	µg/m³	1,000	0.313	--	0.31	--	1.8	0.0024	0.0000	*	0.003	0.0000	*	0.0024	0.0000	*	0.0033	0.0000	*	0.0024	0.0000	*	0.0018	0.0000	*
Molybdenum	µg/m³	--	--	--	--	--	--	0.0035	0.0121		0.0493	0.1408		0.0091	0.0209		0.0804	0.1980		0.0028	0.0068		0.0021	0.0014	*
Nickel	µg/m³	5,000	0.0079	--	0.008	--	6	0.0021	0.0000	*	0.0027	0.0000	*	0.0024	0.0000	*	0.003	0.0000	*	0.0024	0.0000	*	0.0018	0.0012	*
Palladium	µg/m³	--	--	--	--	--	--	0.0054	0.0000	*	0.0054	0.0079	*	0.0048	0.0017	*	0.0054	0.0000	*	0.0048	0.0000	*	0.0021	0.0000	*
Phosphorus	µg/m³	--	--	--	--	--	--	0.0054	0.0000	*	0.0075	0.0000	*	0.0075	0.0000	*	0.009	0.0000	*	0.0063	0.0000	*	0.0036	0.0000	*
Potassium	µg/m³	--	--	--	--	--	--	0.4873	1.6680		0.2281	0.6518		0.7585	1.7420		0.3629	0.8941		0.7778	1.8840		0.2199	1.3500	
Rubidium	µg/m³	--	--	--	--	--	--	0.0012	0.0039	*	0.0058	0.0167		0.0046	0.0105		0.0057	0.0142		0.0050	0.0122		0.0009	0.0026	*
Selenium	µg/m³	500	18.3	--	--	--	--	0.0014	0.0048		0.0838	0.2393		0.0104	0.0238		0.0551	0.1357		0.0062	0.0149		0.0014	0.0087	
Silicon	µg/m³	--	--	--	--	--	--	2.2990	7.8700		1.2150	3.4710		4.5190	10.3800		1.9910	4.9060		4.0840	9.8920		1.0250	6.2890	
Silver	µg/m³	--	--	--	--	--	--	0.0057	0.0085	*	0.0175	0.0499		0.0051	0.0050	*	0.0063	0.0084	*	0.0051	0.0000	*	0.0021	0.0064	*
Sodium	µg/m³	--	--	--	--	--	--	0.1602	0.4530	*	0.0699	0.0000	*	0.0768	0.0000	*	0.0819	0.0000	*	0.0711	0.0000	*	0.4296	2.6370	
Strontium	µg/m³	--	--	--	--	--	--	0.0042	0.0145		0.0024	0.0069		0.0102	0.0235		0.0044	0.0108		0.0074	0.0179		0.0019	0.0118	
Sulfur	µg/m³	--	--	--	--	--	--	0.7882	2.6980		1.8290	5.2260		1.3240	3.0410		2.6230	6.4630		0.6615	1.6020		0.3857	2.3670	
Tin	µg/m³	--	--	--	--	--	--	0.0078	0.0084	*	0.0087	0.0000	*	0.0081	0.0000	*	0.0093	0.0085	*	0.0081	0.0008	*	0.0024	0.0000	*
Titanium	µg/m³	--	--	--	31	--	--	0.0785	0.2687		0.0412	0.1176		0.2212	0.5081		0.1082	0.2667		0.1411	0.3416		0.0277	0.1699	
Vanadium	µg/m³	--	--	--	--	--	--	0.0033	0.0003	*	0.0042	0.0062	*	0.0149	0.0343		0.0042	0.0055	*	0.0074	0.0179		0.0015	0.0000	*
Yttrium	µg/m³	--	--	--	--	--	--	0.0015	0.0027	*	0.0011	0.0031		0.0009	0.0022		0.0017	0.0043		0.0009	0.0021	*	0.0012	0.0000	*
Zinc	µg/m³	--	--	--	--	--	--	0.0141	0.0484		0.4439	1.2680		0.0315	0.0722		0.6545	1.6130		0.0698	0.1690		0.0068	0.0416	
Zirconium	µg/m³	--	--	--	--	--	--	0.0023	0.0077		0.0027	0.0078		0.0054	0.0124		0.0038	0.0093		0.0042	0.0103		0.0015	0.0032	*

Table Notes:

[1] Arizona Department of Environmental Quality Acute and Chronic Ambient Air Concentrations, Title 18 Chapter 2 Article 17, December 2007
[2] Arizona Department of Environmental Quality Ambient Air Quality Standards, Title 18 Chapter 2 Article 2, December 2007
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[6] With the exception of arsenic, the averaging time for all listed analytes is one hour. The averaging time for arsenic is four hours.
[7] The averaging time for the criteria is 24 hours.
[8] The averaging time for the criteria is the annual arithmetic mean.
[9] The averaging time for the criteria is the quarterly average.
[10] Only the PM10 fraction is being measured not the total suspended particulates.
[11] On May 20, 2008, EPA proposed to revise the National Ambient Air Quality (NAAQS) for lead to within the range of 0.1-0.3 mg/m³.
[12] Percent of Total Mass
[13] Precipitation measurements are recorded manually by a Hayden-Winkelman High School employee; reliability cannot be verified.
[14] Bold values with bold outline indicate the result exceeds one or more of the comparison criteria.
[15] Bold italicized values indicate the non-detected result exceeds one or more of the comparison criteria.
[16] * = The result is less than three times the level of uncertainty which is shown in place of the result.
[17] -- = Not established
[18] ºC = Degrees Celsius
[19] % = Percent
[20] J = Estimated value
[21] mph = miles per hour
[22] NA = Not Applicable or Not analyzed
[23] NPR = No precipitation recorded.
[24] NV = Not valid
[25] µg/m³ = Micrograms per cubic meter
[26] PM_{10} = particulate matter with a diameter less than or equal to 10 microns in size
[27] R = Rejected
[28] This table should be considered preliminary and will be revised based on incoming data, final data validation and QA/QC.

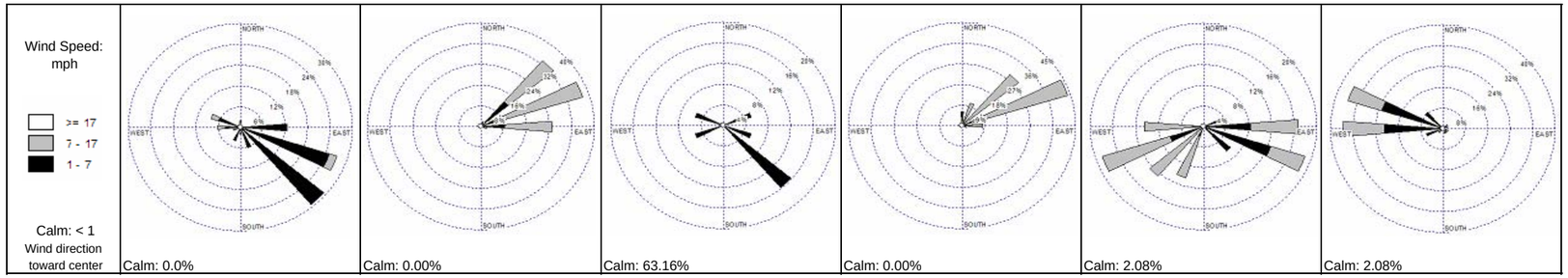

TABLE 4-31

PM_{10} Air Filter Sampling Laboratory Values for Inorganic Parameters

Hayden Monitoring Station

Remedial Investigation Report

ASARCO LLC Hayden, Arizona Plant Site

The data in this table are illustrated on figures 2-6, 4-55, 4-56, 4-57, 4-58, 4-59, and 4-60.

Date:								9/29/2007			10/5/2007			10/11/2007			10/17/2007			10/22/2007			10/27/2007		
Avg Wind Speed mph):								4.72			5.72			3.79			4.54			9.63			4.04		
Avg Wind Direction (degrees):								256			222			206			256			73			100		
Avg Ambient Temperature (ºC):								26.5			27.4			24.1			19.4			19.5			22.5		
Avg Ambient Relative Humidity (%):								6.5			10.1			6.7			7.6			6.9			6.6		
Precipitation (inches)[13]:								9/24 - 2.52			NPR			10/8 - 0.06			NA			NA			NA		
Parameter	**Units**	**Arizona Hazardous Air Pollutants Ambient Air Concentrations (Acute)[1]**	**Arizona Hazardous Air Pollutants Ambient Air Concentrations (Chronic)[1]**	**Arizona Ambient Air Quality Standards[2]**	**EPA Region IX Preliminary Remediation Goal[3]**	**EPA National Ambient Air Quality Standards[4]**	**California Acute Reference Exposure Levels[5 6]**	**Result**	**Percent[12]**	**Qual**	**Result**	**Percent[12]**	**Qual**	**Result**	**Percent[12]**	**Qual**	**Result**	**Percent[12]**	**Qual**	**Result**	**Percent[12]**	**Qual**	**Result**	**Percent[12]**	**Qual**
PM_{10}	µg/m³	--	--	150 [7]/50 [8]	--	150 [7]	--	43.35	NA		24.62	NA		32.19	NA		**59.08**	NA		**54.57**	NA		34.06	NA	
Aluminum	µg/m³	--	--	--	5.1	--	--	1.3710	3.4440		0.8838	3.9280		1.0850	3.6380		2.1750	3.9160		1.0370	1.9920		1.6240	5.0750	
Antimony	µg/m³	13,000	1.46	--	--	--	--	0.003	0.0044	*J	0.003	0.0086	*J	0.0032	0.0109	J	0.0093	0.0086	*	0.0118	0.0226		0.0084	0.0000	*
Arsenic	µg/m³	2,500	0.000441	--	0.00045	--	0.19	**0.0061**	0.0154	J	***0.0015***	0.0023	*J	**0.0095**	0.0317	J	**0.0064**	0.0115		**0.1457**	0.2797		**0.0081**	0.0253	
Barium	µg/m³	--	--	--	0.52	--	--	0.0135	0.0209	*J	0.0075	0.0084	*J	0.0101	0.0338	J	0.0165	0.0214	*	0.0498	0.0956		0.0123	0.0337	*
Bismuth	µg/m³	--	--	--	--	--	--	NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA	
Bromine	µg/m³	--	--	--	--	--	--	0.0015	0.0038		0.0006	0.0025	*	0.0022	0.0074		0.0024	0.0043		0.0048	0.0000	*	0.0012	0.0032	*
Cadmium	µg/m³	250	0.00105	--	0.0011	--	--	***0.0024***	0.0011	*J	***0.0021***	0.0000	*J	***0.0021***	0.0000	*J	***0.0072***	0.0000	*	**0.0108**	0.0207		***0.0057***	0.0000	*
Calcium	µg/m³	--	--	--	--	--	--	0.9384	2.3580		0.4779	2.1240		0.8880	2.9770		1.7410	3.1340		0.7623	1.4130	*	1.1240	3.5120	
Chlorine	µg/m³	--	--	--	--	--	--	0.2712	0.6817		0.1784	0.7927		0.0515	0.1725		0.0266	0.0479		0.0204	0.0069	*	0.0446	0.1395	
Chromium	µg/m³	100	0.000158	--	0.00016	--	--	***0.0012***	0.0026	*J	***0.0009***	0.0002	*J	**0.0013**	0.0044	J	**0.0040**	0.0072		**0.0070**	0.0134		**0.0013**	0.0041	
Cobalt	µg/m³	10,000	0.000686	--	0.00069	--	--	***0.0255***	0.0000	*J	***0.0129***	0.0000	*J	***0.0174***	0.0000	*J	***0.0303***	0.0000	*	***0.0492***	0.0000	*	***0.0207***	0.0000	*
Copper	µg/m³	--	--	--	--	--	100	0.3355	0.8432	J	0.0952	0.4233	J	0.3193	1.0700	J	0.3216	0.5791		3.8800	7.4490		0.3252	1.0160	
Gallium	µg/m³	--	--	--	--	--	--	0.0012	0.0000	*	0.0012	0.0000	*	0.0012	0.0000	*	0.0012	0.0000	*	0.0054	0.0000	*	0.0015	0.0000	*
Germanium	µg/m³	--	--	--	--	--	--	0.0009	0.0000	*	0.0009	0.0000	*	0.0009	0.0000	*	0.0009	0.0000	*	0.0015	0.0000	*	0.0012	0.0000	*
Indium	µg/m³	--	--	--	--	--	--	0.0024	0.0000	*	0.0024	0.0000	*	0.0024	0.0000	*	0.0078	0.0047	*	0.0072	0.0000	*	0.0066	0.0062	*
Iron	µg/m³	--	--	--	--	--	--	1.2590	3.1640		0.6804	3.0240		0.8503	2.8500		1.6520	2.9740		2.6940	5.1720		1.1160	3.4890	
Lanthanum	µg/m³	--	--	--	--	--	--	0.015	0.0005	*	0.0081	0.0046	*	0.0093	0.0000	*	0.018	0.0000	*	0.0237	0.0000	*	0.0198	0.0000	*
Lead	µg/m³	--	--	1.5 [9,10,11]	--	1.5 [9,10,11]	--	0.0273	0.0685		0.0035	0.0157		0.0460	0.1542		0.0194	0.0349		0.5156	0.9899		0.0242	0.0755	
Magnesium	µg/m³	--	--	--	--	--	--	0.2066	0.5192		0.0969	0.4304		0.1349	0.4523		0.3258	0.5866		0.096	0.1809	*	0.1936	0.6049	
Manganese	µg/m³	2,500	0.0521	--	0.051	--	--	R	R		R	R		R	R		0.0262	0.0471		0.0156	0.0300		0.0222	0.0694	
Mercury	µg/m³	1,000	0.313	--	0.31	--	1.8	0.0021	0.0000	*	0.0018	0.0000	*	0.0018	0.0000	*	0.0018	0.0000	*	0.0033	0.0000	*	0.0024	0.0000	*
Molybdenum	µg/m³	--	--	--	--	--	--	0.0052	0.0131		0.0021	0.0029	*	0.0029	0.0098		0.0046	0.0082		0.0630	0.1210		0.0120	0.0375	
Nickel	µg/m³	5,000	0.0079	--	0.008	--	6	0.0018	0.0026	*J	0.0018	0.0021	*J	0.0018	0.0000	*J	0.0018	0.0029	*	0.003	0.0000	*	0.0024	0.0000	*
Palladium	µg/m³	--	--	--	--	--	--	0.0021	0.0000	*	0.0021	0.0000	*	0.0021	0.0000	*	0.0063	0.0019	*	0.0066	0.0000	*	0.0054	0.0000	*
Phosphorus	µg/m³	--	--	--	--	--	--	0.0057	0.0000	*	0.0045	0.0000	*	0.0048	0.0000	*	0.0075	0.0000	*	0.0066	0.0000	*	0.006	0.0000	*
Potassium	µg/m³	--	--	--	--	--	--	0.7411	1.8620		0.4230	1.8800		0.5104	1.7110		0.8889	1.6000		0.5476	1.0510		0.8065	2.5200	
Rubidium	µg/m³	--	--	--	--	--	--	0.0018	0.0046		0.0022	0.0098		0.0011	0.0036		0.0038	0.0068		0.0018	0.0000	*	0.0028	0.0088	
Selenium	µg/m³	500	18.3	--	--	--	--	0.0009	0.0021	*J	0.0006	0.0000	*J	0.0016	0.0054	J	0.0044	0.0079		0.1082	0.2077		0.0017	0.0053	
Silicon	µg/m³	--	--	--	--	--	--	3.4710	8.7220		2.0520	9.1220		2.6070	8.7390		5.2590	9.4690		2.7580	5.2950		3.8190	11.9300	
Silver	µg/m³	--	--	--	--	--	--	0.0021	0.0018	*J	0.0021	0.0004	*J	0.0021	0.0016	*J	0.0069	0.0055	*	0.0147	0.0282		0.0057	0.0021	*
Sodium	µg/m³	--	--	--	--	--	--	0.4821	1.2120		0.3304	1.4690		0.2549	0.8543		0.3433	0.6181		0.1146	0.0000	*	0.1716	0.3210	*
Strontium	µg/m³	--	--	--	--	--	--	0.0065	0.0164		0.0032	0.0142		0.0062	0.0207		0.0111	0.0199		0.0055	0.0105		0.0068	0.0213	
Sulfur	µg/m³	--	--	--	--	--	--	0.6789	1.7060		0.4052	1.8010		0.4580	1.5350		0.7590	1.3670		2.0020	3.8450		0.4906	1.5330	
Tin	µg/m³	--	--	--	--	--	--	0.0027	0.0000	*	0.0024	0.0000	*	0.0027	0.0000	*	0.0087	0.0075	*	0.009	0.0007	*	0.0081	0.0122	*
Titanium	µg/m³	--	--	--	31	--	--	0.1170	0.2939		0.0544	0.2419		0.0636	0.2131		0.1590	0.2862		0.0960	0.1842		0.0921	0.2878	
Vanadium	µg/m³	--	--	--	--	--	--	0.0045	0.0028	*J	0.0024	0.0000	*J	0.0027	0.0000	*J	0.0057	0.0013	*	0.0045	0.0000	*	0.0036	0.0000	*
Yttrium	µg/m³	--	--	--	--	--	--	0.0012	0.0013	*	0.0012	0.0000	*	0.0012	0.0024	*	0.0012	0.0018	*	0.0048	0.0000	*	0.0018	0.0015	*
Zinc	µg/m³	--	--	--	--	--	--	0.0208	0.0523		0.0017	0.0077		0.0327	0.1097		0.0219	0.0394		0.4779	0.9176		0.0284	0.0887	
Zirconium	µg/m³	--	--	--	--	--	--	0.0032	0.0079		0.0024	0.0107		0.0018	0.0062		0.0042	0.0076		0.0043	0.0082		0.0038	0.0119	

Table Notes:

[1] Arizona Department of Environmental Quality Acute and Chronic Ambient Air Concentrations, Title 18 Chapter 2 Article 17, December 2007
[2] Arizona Department of Environmental Quality Ambient Air Quality Standards, Title 18 Chapter 2 Article 2, December 2007
[3] EPA Region IX Preliminary Remediation Goals, Ambient Air, October 2004
[4] EPA National Ambient Air Quality Standards, http://www.epa.gov/air/criteria.html, February 2008
[5] California Acute Reference Exposure Levels, March 1999
[6] With the exception of arsenic, the averaging time for all listed analytes is one hour. The averaging time for arsenic is four hours.
[7] The averaging time for the criteria is 24 hours.
[8] The averaging time for the criteria is the annual arithmetic mean.
[9] The averaging time for the criteria is the quarterly average.
[10] Only the PM10 fraction is being measured not the total suspended particulates.
[11] On May 20, 2008, EPA proposed to revise the National Ambient Air Quality (NAAQS) for lead to within the range of 0.1-0.3 mg/m³.
[12] Percent of Total Mass
[13] Precipitation measurements are recorded manually by a Hayden-Winkelman High School employee; reliability cannot be verified.
[14] Bold values with bold outline indicate the result exceeds one or more of the comparison criteria.
[15] Bold italicized values indicate the non-detected result exceeds one or more of the comparison criteria.
[16] * = The result is less than three times the level of uncertainty which is shown in place of the result.
[17] -- = Not established
[18] ºC = Degrees Celsius
[19] % = Percent
[20] J = Estimated value
[21] mph = miles per hour
[22] NA = Not Applicable or Not analyzed
[23] NPR = No precipitation recorded.
[24] NV = Not valid
[25] µg/m³ = Micrograms per cubic meter
[26] PM_{10} = particulate matter with a diameter less than or equal to 10 microns in size
[27] R = Rejected
[28] This table should be considered preliminary and will be revised based on incoming data, final data validation and QA/QC.

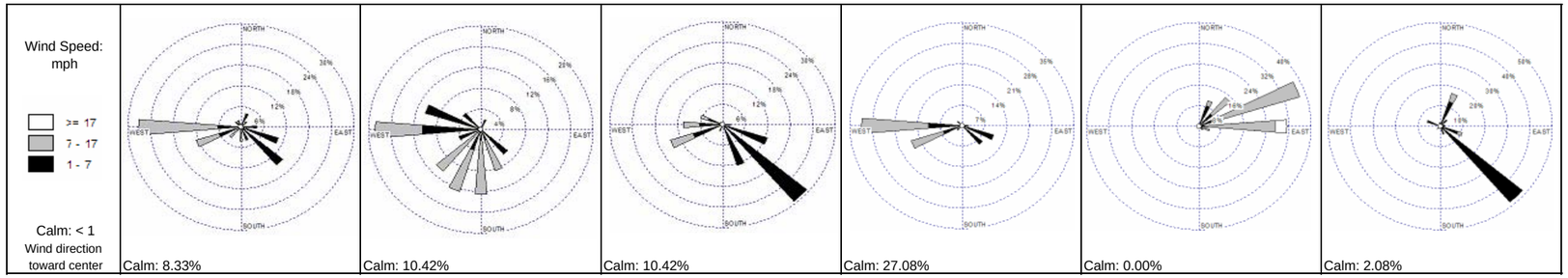

TABLE 4-31

PM_{10} Air Filter Sampling Laboratory Values for Inorganic Parameters

Hayden Monitoring Station

Remedial Investigation Report

ASARCO LLC Hayden, Arizona Plant Site

The data in this table are illustrated on figures 2-6, 4-55, 4-56, 4-57, 4-58, 4-59, and 4-60.

Date:								11/1/2007			11/7/2007			03/12/08			03/14/08			03/20/08			03/26/08		
Avg Wind Speed mph):								3.67			8.95			2.73			NV			3.73			3.11		
Avg Wind Direction (degrees):								177			68			126			NV			203			256		
Avg Ambient Temperature (ºC):								19.9			20.2			10.3			NV			16.4			19.2		
Avg Ambient Relative Humidity (%):								6.9			6.9			9.5			NV			7.6			6.9		
Precipitation (inches)[13]:								NA			NA			NA			NA			NA			NA		
Parameter	Units	Arizona Hazardous Air Pollutants Ambient Air Concentrations (Acute)[1]	Arizona Hazardous Air Pollutants Ambient Air Concentrations (Chronic)[1]	Arizona Ambient Air Quality Standards[2]	EPA Region IX Preliminary Remediation Goal[3]	EPA National Ambient Air Quality Standards[4]	California Acute Reference Exposure Levels[5 6]	Result	Percent[12]	Qual	Result	Percent[12]	Qual	Result	Percent[12]	Qual	Result	Percent[12]	Qual	Result	Percent[12]	Qual	Result	Percent[12]	Qual
PM_{10}	µg/m³	--	--	150 [7]/50 [8]	--	150 [7]	--	32.98	NA		**69.12**	NA		19.29	NA		NV	NV		29.53	NA		28.67	NA	
Aluminum	µg/m³	--	--	--	5.1	--	--	1.2610	4.0510		1.7920	2.7420		0.6544	3.4770		NV	NV		1.1140	3.9510		0.7213	2.6590	
Antimony	µg/m³	13,000	1.46	--	--	--	--	0.0084	0.0000	*	0.0207	0.0045	*	0.0060	0.0188	*	NV	NV		0.0027	0.0022	*	0.0027	0.0045	*
Arsenic	µg/m³	2,500	0.000441	--	0.00045	--	0.19	**0.0054**	0.0172		**0.0679**	0.1039		**0.0079**	0.0418		NV	NV		**0.0039**	0.0139		***0.0027***	0.0078	*
Barium	µg/m³	--	--	--	0.52	--	--	0.0147	0.0296	*	0.0222	0.0271	*	0.0114	0.0000	*	NV	NV		0.0102	0.0159	*	0.0078	0.0036	*
Bismuth	µg/m³	--	--	--	--	--	--	NA	NA		NA	NA		NA	NA		NV	NV		NA	NA		NA	NA	
Bromine	µg/m³	--	--	--	--	--	--	0.0035	0.0113		0.0042	0.0002	*	0.0038	0.0200		NV	NV		0.0031	0.0108		0.0056	0.0208	
Cadmium	µg/m³	250	0.00105	--	0.0011	--	--	***0.0057***	0.0020	*	***0.0144***	0.0000	*	0.0042	0.0000	*	NV	NV		0.0021	0.0012	*	0.0018	0.0000	*
Calcium	µg/m³	--	--	--	--	--	--	1.2410	3.9880		2.9470	4.5100		0.4078	2.1660		NV	NV		1.1700	4.1490		0.8178	3.0150	
Chlorine	µg/m³	--	--	--	--	--	--	0.0222	0.0712		0.0198	0.0045	*	0.0194	0.1030		NV	NV		0.0309	0.1097		0.0790	0.2913	
Chromium	µg/m³	100	0.000158	--	0.00016	--	--	**0.0032**	0.0104		**0.0030**	0.0045		***0.0021***	0.0077	*	NV	NV		***0.0012***	0.0022	*	**0.0017**	0.0064	
Cobalt	µg/m³	10,000	0.000686	--	0.00069	--	--	***0.0183***	0.0000	*	***0.0387***	0.0000	*	0.0123	0.0000	*	NV	NV		0.0156	0.0000	*	0.0126	0.0000	*
Copper	µg/m³	--	--	--	--	--	100	0.2026	0.6508		3.2180	4.9230		0.2704	1.4370		NV	NV		0.2691	0.9541		0.2024	0.7460	
Gallium	µg/m³	--	--	--	--	--	--	0.0015	0.0000	*	0.0051	0.0000	*	0.0027	0.0000	*	NV	NV		0.0012	0.0000	*	0.0012	0.0000	*
Germanium	µg/m³	--	--	--	--	--	--	0.0012	0.0000	*	0.003	0.0000	*	0.0024	0.0041	*	NV	NV		0.0012	0.0000	*	0.0009	0.0000	*
Indium	µg/m³	--	--	--	--	--	--	0.0063	0.0029	*	0.0153	0.0000	*	0.0048	0.0012	*	NV	NV		0.0021	0.0000	*	0.0021	0.0000	*
Iron	µg/m³	--	--	--	--	--	--	1.0480	3.3660		2.0900	3.1980		0.5798	3.0800		NV	NV		0.8418	2.9840		0.6822	2.5150	
Lanthanum	µg/m³	--	--	--	--	--	--	0.0243	0.0000	*	0.0354	0.0000	*	0.0186	0.0000	*	NV	NV		0.0171	0.0057	*	0.0132	0.0134	*
Lead	µg/m³	--	--	1.5 [9,10,11]	--	1.5 [9,10,11]	--	0.0202	0.0650		0.3183	0.4871		0.0182	0.0965		NV	NV		0.0152	0.0539		0.0125	0.0460	
Magnesium	µg/m³	--	--	--	--	--	--	0.2403	0.7721		0.2414	0.3694		0.1138	0.6044		NV	NV		0.3135	1.1110		0.2193	0.8084	
Manganese	µg/m³	2,500	0.0521	--	0.051	--	--	0.0192	0.0617		0.0265	0.0405		0.0064	0.0341		NV	NV		0.0134	0.0474		0.0103	0.0380	
Mercury	µg/m³	1,000	0.313	--	0.31	--	1.8	0.0024	0.0011	*	0.0069	0.0000	*	0.0051	0.0000	*	NV	NV		0.0024	0.0000	*	0.0021	0.0000	*
Molybdenum	µg/m³	--	--	--	--	--	--	0.0047	0.0150		0.0509	0.0779		0.0066	0.0065	*	NV	NV		0.0049	0.0174		0.0032	0.0120	
Nickel	µg/m³	5,000	0.0079	--	0.008	--	6	0.0027	0.0021	*	0.0066	0.0000	*	0.0051	0.0171	*	NV	NV		0.0024	0.0007	*	0.0021	0.0000	*
Palladium	µg/m³	--	--	--	--	--	--	0.0054	0.0000	*	0.0144	0.0107	*	0.0039	0.0000	*	NV	NV		0.0018	0.0000	*	0.0018	0.0000	*
Phosphorus	µg/m³	--	--	--	--	--	--	0.006	0.0000	*	0.0129	0.0000	*	0.0075	0.0000	*	NV	NV		0.0057	0.0000	*	0.0048	0.0000	*
Potassium	µg/m³	--	--	--	--	--	--	0.5066	1.6280		0.7981	1.2210		0.2961	1.5730		NV	NV		0.4226	1.4980		0.2662	0.9812	
Rubidium	µg/m³	--	--	--	--	--	--	0.0029	0.0094		0.0033	0.0000	*	0.0024	0.0029	*	NV	NV		0.0020	0.0072		0.0012	0.0028	*
Selenium	µg/m³	500	18.3	--	--	--	--	0.0017	0.0054		0.0347	0.0531		0.0021	0.0000	*	NV	NV		0.0009	0.0008	*	0.0009	0.0000	*
Silicon	µg/m³	--	--	--	--	--	--	3.0580	9.8240		4.8450	7.4140		1.7050	9.0580		NV	NV		3.4400	12.1900		1.9060	7.0280	
Silver	µg/m³	--	--	--	--	--	--	0.0057	0.0000	*	0.0144	0.0000	*	0.0042	0.0188	*	NV	NV		0.0021	0.0025	*	0.0018	0.0000	*
Sodium	µg/m³	--	--	--	--	--	--	0.1716	0.3742	*	0.1677	0.0000	*	0.2214	0.5568	*	NV	NV		0.1641	0.3443	*	0.1500	0.4034	*
Strontium	µg/m³	--	--	--	--	--	--	0.0084	0.0271		0.0124	0.0190		0.0038	0.0200		NV	NV		0.0050	0.0177		0.0041	0.0153	
Sulfur	µg/m³	--	--	--	--	--	--	0.6855	2.2030		1.6200	2.4780		0.3418	1.8160		NV	NV		0.6884	2.4400		0.5090	1.8760	
Tin	µg/m³	--	--	--	--	--	--	0.0078	0.0020	*	0.0198	0.0066	*	0.0066	0.0082	*	NV	NV		0.0027	0.0000	*	0.0030	0.0062	*
Titanium	µg/m³	--	--	--	31	--	--	0.1209	0.3883		0.1424	0.2180		0.0434	0.2307		NV	NV		0.0787	0.2789		0.0547	0.2015	
Vanadium	µg/m³	--	--	--	--	--	--	0.0048	0.0000	*	0.0063	0.0000	*	0.0027	0.0000	*	NV	NV		0.0030	0.0015	*	0.0024	0.0010	*
Yttrium	µg/m³	--	--	--	--	--	--	0.0018	0.0015	*	0.0054	0.0000	*	0.0036	0.0012	*	NV	NV		0.0015	0.0000	*	0.0015	0.0000	*
Zinc	µg/m³	--	--	--	--	--	--	0.0204	0.0657		0.3012	0.4609		0.0195	0.1036		NV	NV		0.0147	0.0522		0.0144	0.0529	
Zirconium	µg/m³	--	--	--	--	--	--	0.0028	0.0089		0.006	0.0066	*	0.0048	0.0171	*	NV	NV		0.0021	0.0072	*	0.0018	0.0012	*

Table Notes:

[1] Arizona Department of Environmental Quality Acute and Chronic Ambient Air Concentrations, Title 18 Chapter 2 Article 17, December 2007
[2] Arizona Department of Environmental Quality Ambient Air Quality Standards, Title 18 Chapter 2 Article 2, December 2007
[3] EPA Region IX Preliminary Remediation Goals, Ambient Air, October 2004
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[12] Percent of Total Mass
[13] Precipitation measurements are recorded manually by a Hayden-Winkelman High School employee; reliability cannot be verified.
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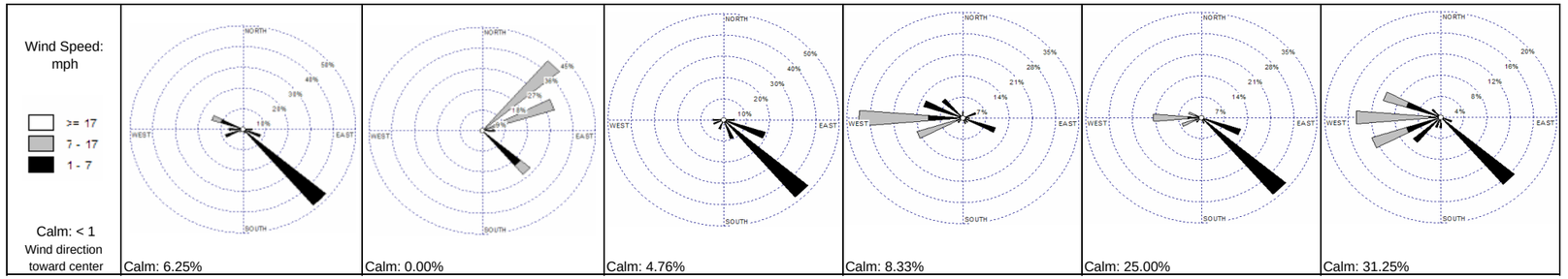

TABLE 4-31

PM_{10} Air Filter Sampling Laboratory Values for Inorganic Parameters

Hayden Monitoring Station

Remedial Investigation Report

ASARCO LLC Hayden, Arizona Plant Site

The data in this table are illustrated on figures 2-6, 4-55, 4-56, 4-57, 4-58, 4-59, and 4-60.

Date:								**03/30/08**		
Avg Wind Speed mph):								**5.84**		
Avg Wind Direction (degrees):		**Arizona Hazardous Air Pollutants Ambient Air Concentrations (Acute)[1]**	**Arizona Hazardous Air Pollutants Ambient Air Concentrations (Chronic)[1]**	**Arizona Ambient Air Quality Standards[2]**	**EPA Region IX Preliminary Remediation Goal[3]**	**EPA National Ambient Air Quality Standards[4]**	**California Acute Reference Exposure Levels[5 6]**	**242**		
Avg Ambient Temperature (ºC):								**20.1**		
Avg Ambient Relative Humidity (%):								**7**		
Precipitation (inches)[13]:								**NA**		
Parameter	**Units**							**Result**	**Percent[12]**	**Qual**
PM_{10}	µg/m^3	--	--	150 [7]/50 [8]	--	150 [7]	--	1.16	NA	
Aluminum	µg/m^3	--	--	--	5.1	--	--	0.0105	0.9475	*
Antimony	µg/m^3	13,000	1.46	--	--	--	--	0.0024	0.0000	*
Arsenic	µg/m^3	2,500	0.000441	--	0.00045	--	0.19	0.0009	0.0304	*
Barium	µg/m^3	--	--	--	0.52	--	--	0.0033	0.2825	*
Bismuth	µg/m^3	--	--	--	--	--	--	NA	NA	
Bromine	µg/m^3	--	--	--	--	--	--	0.0006	0.0043	*
Cadmium	µg/m^3	250	0.00105	--	0.0011	--	--	0.0018	0.0000	*
Calcium	µg/m^3	--	--	--	--	--	--	0.0129	1.1860	
Chlorine	µg/m^3	--	--	--	--	--	--	0.0036	0.1782	*
Chromium	µg/m^3	100	0.000158	--	0.00016	--	--	0.0009	0.0000	*
Cobalt	µg/m^3	10,000	0.000686	--	0.00069	--	--	0.0024	0.0000	*
Copper	µg/m^3	--	--	--	--	--	100	0.0045	0.4129	
Gallium	µg/m^3	--	--	--	--	--	--	0.0012	0.0478	*
Germanium	µg/m^3	--	--	--	--	--	--	0.0009	0.0000	*
Indium	µg/m^3	--	--	--	--	--	--	0.0018	0.0261	*
Iron	µg/m^3	--	--	--	--	--	--	0.0087	0.7997	
Lanthanum	µg/m^3	--	--	--	--	--	--	0.0030	0.1652	*
Lead	µg/m^3	--	--	1.5 [9,10,11]	--	1.5 [9,10,11]	--	0.0024	0.0043	*
Magnesium	µg/m^3	--	--	--	--	--	--	0.0117	0.4042	*
Manganese	µg/m^3	2,500	0.0521	--	0.051	--	--	0.0012	0.0000	*
Mercury	µg/m^3	1,000	0.313	--	0.31	--	1.8	0.0021	0.0391	*
Molybdenum	µg/m^3	--	--	--	--	--	--	0.0027	0.0000	*
Nickel	µg/m^3	5,000	0.0079	--	0.008	--	6	0.0021	0.0087	*
Palladium	µg/m^3	--	--	--	--	--	--	0.0018	0.0000	*
Phosphorus	µg/m^3	--	--	--	--	--	--	0.0024	0.0000	*
Potassium	µg/m^3	--	--	--	--	--	--	0.0034	0.3173	
Rubidium	µg/m^3	--	--	--	--	--	--	0.0009	0.0217	*
Selenium	µg/m^3	500	18.3	--	--	--	--	0.0009	0.0043	*
Silicon	µg/m^3	--	--	--	--	--	--	0.0186	1.7170	
Silver	µg/m^3	--	--	--	--	--	--	0.0018	0.0000	*
Sodium	µg/m^3	--	--	--	--	--	--	0.0300	1.5780	*
Strontium	µg/m^3	--	--	--	--	--	--	0.0012	0.0391	*
Sulfur	µg/m^3	--	--	--	--	--	--	0.0018	0.0956	*
Tin	µg/m^3	--	--	--	--	--	--	0.0027	0.0000	*
Titanium	µg/m^3	--	--	--	31	--	--	0.0009	0.0000	*
Vanadium	µg/m^3	--	--	--	--	--	--	0.0006	0.0000	*
Yttrium	µg/m^3	--	--	--	--	--	--	0.0015	0.0304	*
Zinc	µg/m^3	--	--	--	--	--	--	0.0015	0.0000	*
Zirconium	µg/m^3	--	--	--	--	--	--	0.0018	0.0000	*

Table Notes:

[1] Arizona Department of Environmental Quality Acute and Chronic Ambient Air Concentrations, Title 18 Chapter 2 Article 17, December 2007
[2] Arizona Department of Environmental Quality Ambient Air Quality Standards, Title 18 Chapter 2 Article 2, December 2007
[3] EPA Region IX Preliminary Remediation Goals, Ambient Air, October 2004
[4] EPA National Ambient Air Quality Standards, http://www.epa.gov/air/criteria.html, February 2008
[5] California Acute Reference Exposure Levels, March 1999
[6] With the exception of arsenic, the averaging time for all listed analytes is one hour. The averaging time for arsenic is four hours.
[7] The averaging time for the criteria is 24 hours.
[8] The averaging time for the criteria is the annual arithmetic mean.
[9] The averaging time for the criteria is the quarterly average.
[10] Only the PM10 fraction is being measured not the total suspended particulates.
[11] On May 20, 2008, EPA proposed to revise the National Ambient Air Quality (NAAQS) for lead to within the range of 0.1-0.3 mg/m^3.
[12] Percent of Total Mass
[13] Precipitation measurements are recorded manually by a Hayden-Winkelman High School employee; reliability cannot be verified.
[14] Bold values with bold outline indicate the result exceeds one or more of the comparison criteria.
[15] Bold italicized values indicate the non-detected result exceeds one or more of the comparison criteria.
[16] * = The result is less than three times the level of uncertainty which is shown in place of the result.
[17] -- = Not established
[18] ºC = Degrees Celsius
[19] % = Percent
[20] J = Estimated value
[21] mph = miles per hour
[22] NA = Not Applicable or Not analyzed
[23] NPR = No precipitation recorded.
[24] NV = Not valid
[25] µg/m^3 = Micrograms per cubic meter
[26] PM_{10} = particulate matter with a diameter less than or equal to 10 microns in size
[27] R = Rejected
[28] This table should be considered preliminary and will be revised based on incoming data, final data validation and QA/QC.

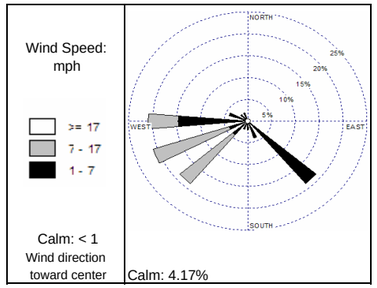

TABLE 4-32

PM_{10} Air Filter Sampling Laboratory Values for Inorganic Parameters

Winkelman Monitoring Station

Remedial Investigation Report

ASARCO LLC Hayden, Arizona Plant Site

The data in this table are illustrated on figures 2-6, 4-55, 4-56, 4-57, 4-58, 4-59, and 4-60.

Date:		Arizona Hazardous Air Pollutants Ambient Air Concentrations (Acute)[1]	Arizona Hazardous Air Pollutants Ambient Air Concentrations (Chronic)[1]	Arizona Ambient Air Quality Standards[2]	EPA Region IX Preliminary Remediation Goal[3]	EPA National Ambient Air Quality Standards[4]	California Acute Reference Exposure Levels[5 6]	11/21/06			11/27/06			12/03/06			12/09/06			12/15/06			12/21/06		
Avg Wind Speed (mph):								7.02			2.98			13.36			7.83			2.55			3.23		
Avg Wind Direction (degrees):								64			279			86			54			57			297		
Avg Ambient Temperature (ºC):								20.2			11.8			12.8			15.3			12.8			5.4		
Avg Ambient Relative Humidity (%):								18.8			27.6			8.7			25.9			21.2			26.6		
Precipitation (inches)[13]:								NPR			NPR			NPR			NPR			NPR			NPR		
Parameter	Units							Result	Percent[12]	Qual	Result	Percent[12]	Qual	Result	Percent[12]	Qual	Result	Percent[12]	Qual	Result	Percent[12]	Qual	Result	Percent[12]	Qual
PM_{10}	µg/m³	--	--	150 [7]/50 [8]	--	150 [7]	--	18.25	NA		10.39	NA		6.63	NA		8.21	NA		12.39	NA		11.88	NA	
Aluminum	µg/m³	--	--	--	5.1	--	--	0.4238	2.445		0.1112	1.102		0.0968	1.489		0.1585	2.002		0.3082	2.568		0.3362	2.831	
Antimony	µg/m³	13,000	1.46	--	--	--	--	0.0036	0.0000	*	0.0033	0.0000	*	0.0033	0.0058	*	0.0036	0.0172	*	0.0036	0.0137	*	0.0048	0.0000	*
Arsenic	µg/m³	2,500	0.000441	--	0.00045	--	0.19	***0.0024***	0.0117	*	***0.003***	0.0070	*	***0.0012***	0.0000	*	***0.0012***	0.0077	*	**0.0110**	0.0914		**0.0052**	0.0436	
Barium	µg/m³	--	--	--	0.52	--	--	0.0080	0.0462		0.0051	0.0037	*	0.0051	0.0514	*	0.006	0.0452	*	0.0066	0.0538	*	0.0066	0.0135	*
Bismuth	µg/m³	--	--	--	--	--	--	NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA	
Bromine	µg/m³	--	--	--	--	--	--	0.0030	0.0171		0.0033	0.0327		0.0015	0.0232		0.0025	0.0315		0.0040	0.0334		0.0020	0.0170	
Cadmium	µg/m³	250	0.00105	--	0.0011	--	--	***0.0027***	0.0065	*	***0.0024***	0.0070	*	***0.0024***	0.0000	*	***0.0024***	0.0000	*	***0.0024***	0.0047	*	***0.0033***	0.0000	*
Calcium	µg/m³	--	--	--	--	--	--	0.5612	3.238		0.1337	1.326		0.1041	1.602		0.3071	3.879		0.2914	2.428		0.4466	3.761	
Chlorine	µg/m³	--	--	--	--	--	--	0.0072	0.0000	*	0.2455	2.435		0.0051	0.0000	*	0.006	0.0000	*	0.0069	0.0118	*	0.0066	0.0000	*
Chromium	µg/m³	100	0.000158	--	0.00016	--	--	***0.0012***	0.0000	*	***0.0012***	0.0000	*	***0.0012***	0.0043	*	***0.0012***	0.0024	*	***0.0012***	0.0000	*	***0.0012***	0.0020	*
Cobalt	µg/m³	10,000	0.000686	--	0.00069	--	--	***0.0063***	0.0000	*	***0.0036***	0.0000	*	***0.0033***	0.0000	*	***0.0051***	0.0000	*	***0.0063***	0.0000	*	***0.006***	0.0000	*
Copper	µg/m³	--	--	--	--	--	100	0.0700	0.4036		0.1022	1.013		0.0107	0.1652		0.0569	0.7190		0.2806	2.338		0.1418	1.194	
Gallium	µg/m³	--	--	--	--	--	--	0.0015	0.0000	*	0.0012	0.0000	*	0.0012	0.0000	*	0.0012	0.0000	*	0.0015	0.0000	*	0.0015	0.0000	*
Germanium	µg/m³	--	--	--	--	--	--	0.0012	0.0000	*	0.0012	0.0000	*	0.0012	0.0000	*	0.0012	0.0000	*	0.0012	0.0000	*	0.0012	0.0000	*
Indium	µg/m³	--	--	--	--	--	--	0.003	0.0114	*	0.0027	0.0023	*	0.0027	0.0000	*	0.0027	0.0000	*	0.0027	0.0035	*	0.0036	0.0000	*
Iron	µg/m³	--	--	--	--	--	--	0.3165	1.826		0.1134	1.125		0.0668	1.027		0.2642	3.338		0.3353	2.794		0.3122	2.629	
Lanthanum	µg/m³	--	--	--	--	--	--	0.0117	0.0000	*	0.0057	0.0000	*	0.0048	0.0000	*	0.0087	0.0000	*	0.0096	0.0000	*	0.0102	0.0000	*
Lead	µg/m³	--	--	1.5 [9,0,11]	--	1.5 [9,0,11]	--	0.0033	0.0190	*	0.0114	0.1130		0.0027	0.0145	*	0.003	0.0172	*	0.0261	0.2174		0.0195	0.1641	
Magnesium	µg/m³	--	--	--	--	--	--	0.0255	0.0255	*	0.039	0.2470	*	0.0171	0.1579	*	0.0198	0.0821	*	0.0393	0.2845	*	0.0534	0.4500	
Manganese	µg/m³	2,500	0.0521	--	0.051	--	--	0.0055	0.0318		0.0016	0.0159		0.0015	0.0094	*	0.0026	0.0333		0.0036	0.0298		0.0048	0.0408	
Mercury	µg/m³	1,000	0.313	--	0.31	--	1.8	0.003	0.0000	*	0.0027	0.0000	*	0.0027	0.0000	*	0.003	0.0000	*	0.003	0.0000	*	0.003	0.0000	*
Molybdenum	µg/m³	--	--	--	--	--	--	0.0033	0.0000	*	0.003	0.0159	*	0.003	0.0000	*	0.003	0.0000	*	0.0033	0.0275		0.0033	0.0234	*
Nickel	µg/m³	5,000	0.0079	--	0.008	--	6	0.0024	0.0005	*	0.0021	0.0000	*	0.0021	0.0000	*	0.0024	0.0071	*	0.0024	0.0106	*	0.0024	0.0000	*
Palladium	µg/m³	--	--	--	--	--	--	0.0024	0.0060	*	0.0024	0.0140	*	0.0024	0.0000	*	0.0024	0.0000	*	0.0024	0.0047	*	0.0033	0.0000	*
Phosphorus	µg/m³	--	--	--	--	--	--	0.0066	0.0000	*	0.0051	0.0000	*	0.0045	0.0000	*	0.0054	0.0000	*	0.006	0.0000	*	0.0057	0.0000	*
Potassium	µg/m³	--	--	--	--	--	--	0.1897	1.094		0.0774	0.7677		0.0422	0.6498		0.1280	1.617		0.1374	1.145		0.1674	1.410	
Rubidium	µg/m³	--	--	--	--	--	--	0.0015	0.0041	*	0.0015	0.0000	*	0.0015	0.0007	*	0.0015	0.0018	*	0.0015	0.0047	*	0.0015	0.0056	*
Selenium	µg/m³	500	18.3	--	--	--	--	0.0012	0.0000	*	0.0012	0.0112	*	0.0012	0.0000	*	0.0012	0.0000	*	0.0030	0.0247		0.0015	0.0127	
Silicon	µg/m³	--	--	--	--	--	--	1.1660	6.728		0.3311	3.284		0.2895	4.454		0.4497	5.681		0.7919	6.600		0.8899	7.494	
Silver	µg/m³	--	--	--	--	--	--	0.0024	0.0000	*	0.0024	0.0126	*	0.0024	0.0094	*	0.0024	0.0036	*	0.0024	0.0082	*	0.0033	0.0000	*
Sodium	µg/m³	--	--	--	--	--	--	0.0465	0.1209	*	0.2498	2.478		0.0321	0.0000	*	0.0372	0.1249	*	0.0429	0.0000	*	0.0426	0.1542	*
Strontium	µg/m³	--	--	--	--	--	--	0.0037	0.0212		0.0015	0.0084	*	0.0015	0.0058	*	0.0024	0.0303		0.0032	0.0267		0.0029	0.0246	
Sulfur	µg/m³	--	--	--	--	--	--	0.7576	4.371		0.3599	3.569		0.1621	2.494		0.2414	3.050		0.4203	3.503		0.2631	2.215	
Tin	µg/m³	--	--	--	--	--	--	0.003	0.0090	*	0.0041	0.0406		0.003	0.0159	*	0.0041	0.0523		0.0033	0.0255	*	0.0042	0.0079	*
Titanium	µg/m³	--	--	--	31	--	--	0.0276	0.1594		0.0086	0.0850		0.0049	0.0761		0.0179	0.2260		0.0207	0.1722		0.0236	0.1990	
Vanadium	µg/m³	--	--	--	--	--	--	0.0018	0.0000	*	0.0012	0.0107	*	0.0009	0.0000	*	0.0015	0.0000	*	0.0015	0.0000	*	0.0015	0.0000	*
Yttrium	µg/m³	--	--	--	--	--	--	0.0018	0.0000	*	0.0018	0.0000	*	0.0018	0.0029	*	0.0018	0.0024	*	0.0018	0.0000	*	0.0018	0.0000	*
Zinc	µg/m³	--	--	--	--	--	--	0.0068	0.0391		0.0111	0.1097		0.0015	0.0239	*	0.0046	0.0583		0.0197	0.1640		0.0133	0.1122	
Zirconium	µg/m³	--	--	--	--	--	--	0.0024	0.0033	*	0.0021	0.0037	*	0.0021	0.0174	*	0.0024	0.0000	*	0.0024	0.0000	*	0.0021	0.0000	*

Table Notes:

[1] Arizona Department of Environmental Quality Acute and Chronic Ambient Air Concentrations, Title 18 Chapter 2 Article 17, December 2007
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[12] Percent of Total Mass
[13] Precipitation measurements are recorded manually by a Hayden-Winkelman High School employee; reliability cannot be verified.
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[26] R = Rejected
[27] This table should be considered preliminary and will be revised based on incoming data, final data validation and QA/QC.

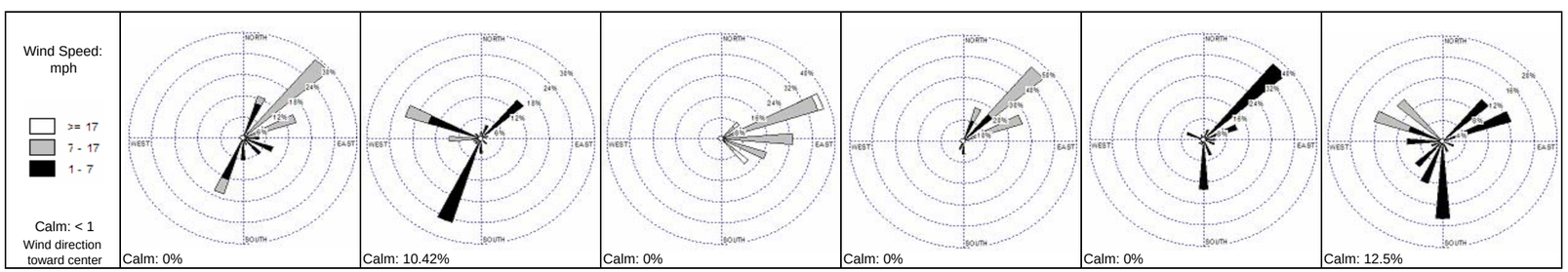

TABLE 4-32

PM_{10} Air Filter Sampling Laboratory Values for Inorganic Parameters

Winkelman Monitoring Station

Remedial Investigation Report

ASARCO LLC Hayden, Arizona Plant Site

The data in this table are illustrated on figures 2-6, 4-55, 4-56, 4-57, 4-58, 4-59, and 4-60.

Date:		Arizona Hazardous Air Pollutants Ambient Air Concentrations (Acute)[1]	Arizona Hazardous Air Pollutants Ambient Air Concentrations (Chronic)[1]	Arizona Ambient Air Quality Standards[2]	EPA Region IX Preliminary Remediation Goal[3]	EPA National Ambient Air Quality Standards[4]	California Acute Reference Exposure Levels[5 6]	12/27/06			01/02/07			01/08/07			01/14/07			01/20/07			01/26/07		
Avg Wind Speed (mph):								3.54			5.65			6.52			3.48			1.99			4.60		
Avg Wind Direction (degrees):								267			73			83			286			317			10		
Avg Ambient Temperature (ºC):								10.7			11.6			13.8			2.3			6.6			10.6		
Avg Ambient Relative Humidity (%):								15			32			14.3			14.6			50.3			34.3		
Precipitation (inches)[13]:								NPR			12/29 - 0.68			NPR			1/12 - 0.81			1/19 - 1.00			NPR		
Parameter	**Units**							**Result**	**Percent[12]**	**Qual**	**Result**	**Percent[12]**	**Qual**	**Result**	**Percent[12]**	**Qual**	**Result**	**Percent[12]**	**Qual**	**Result**	**Percent[12]**	**Qual**	**Result**	**Percent[12]**	**Qual**
PM_{10}	µg/m³	--	--	150 [7]/50 [8]	--	150 [7]	--	15.66	NA		11.38	NA		4.37	NA		10.88	NA		6.01	NA		7.29	NA	
Aluminum	µg/m³	--	--	--	5.1	--	--	0.4755	3.135		0.1831	1.652		0.0505	1.188		0.2807	2.551		0.0763	1.281		0.2565	3.600	
Antimony	µg/m³	13,000	1.46	--	--	--	--	0.0048	0.0102	*	0.0048	0.0093	*	0.0033	0.0000	*	0.0033	0.0026	*	0.0024	0.0087	*	0.0024	0.0059	*
Arsenic	µg/m³	2,500	0.000441	--	0.00045	--	0.19	**0.0131**	0.0863		**0.0077**	0.0697		***0.0012***	0.0011	*	**0.0105**	0.0955		***0.0024***	0.0284	*	**0.0044**	0.0621	
Barium	µg/m³	--	--	--	0.52	--	--	0.0069	0.0369	*	0.0066	0.0489	*	0.0042	0.0011	*	0.006	0.0235	*	0.0045	0.0008	*	0.0057	0.0271	*
Bismuth	µg/m³	--	--	--	--	--	--	NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA	
Bromine	µg/m³	--	--	--	--	--	--	0.0012	0.0009	*	0.0012	0.0119	*	0.0012	0.0177	*	0.0012	0.0060	*	0.0013	0.0221		0.0009	0.0073	*
Cadmium	µg/m³	250	0.00105	--	0.0011	--	--	***0.0033***	0.0016	*	***0.0033***	0.0030	*	***0.0024***	0.0000	*	***0.0024***	0.0000	*	***0.0018***	0.0024	*	***0.0018***	0.0099	*
Calcium	µg/m³	--	--	--	--	--	--	0.3616	2.384		0.1916	1.729		0.0724	1.704		0.2807	2.551		0.0904	1.516		0.2395	3.362	
Chlorine	µg/m³	--	--	--	--	--	--	0.0454	0.2996		0.0066	0.0000	*	0.0051	0.0310	*	0.2355	2.141		0.0072	0.1201	*	0.006	0.0053	*
Chromium	µg/m³	100	0.000158	--	0.00016	--	--	***0.0012***	0.0022	*	***0.0012***	0.0000	*	***0.0009***	0.0000	*	***0.0012***	0.0013	*	**0.0030**	0.0498		***0.0009***	0.0079	*
Cobalt	µg/m³	10,000	0.000686	--	0.00069	--	--	***0.0069***	0.0000	*	***0.0063***	0.0000	*	***0.0027***	0.0000	*	***0.0048***	0.0000	*	***0.0048***	0.0000	*	***0.0066***	0.0000	*
Copper	µg/m³	--	--	--	--	--	100	0.2996	1.976		0.3428	3.093		0.0159	0.3745		0.0884	0.8038		0.2415	4.054		0.2235	3.137	
Gallium	µg/m³	--	--	--	--	--	--	0.0015	0.0000	*	0.0015	0.0000	*	0.0012	0.0000	*	0.0012	0.0000	*	0.0015	0.0000	*	0.0015	0.0000	*
Germanium	µg/m³	--	--	--	--	--	--	0.0012	0.0000	*	0.0012	0.0000	*	0.0012	0.0000	*	0.0012	0.0000	*	0.0012	0.0000	*	0.0012	0.0000	*
Indium	µg/m³	--	--	--	--	--	--	0.0036	0.0000	*	0.0039	0.0000	*	0.0024	0.0000	*	0.0027	0.0090	*	0.0021	0.0000	*	0.0021	0.0000	*
Iron	µg/m³	--	--	--	--	--	--	0.3769	2.485		0.3192	2.880		0.0467	1.098		0.2326	2.114		0.2282	3.829		0.3010	4.225	
Lanthanum	µg/m³	--	--	--	--	--	--	0.0108	0.0000	*	0.009	0.0000	*	0.0042	0.0000	*	0.0096	0.0000	*	0.0048	0.0134	*	0.0096	0.0026	*
Lead	µg/m³	--	--	1.5 [9,0,11]	--	1.5 [9,0,11]	--	0.0275	0.1813		0.0153	0.1376		0.0027	0.0055	*	0.0109	0.0989		0.0050	0.0838		0.0085	0.1196	
Magnesium	µg/m³	--	--	--	--	--	--	0.0793	0.5228		0.0372	0.2201	*	0.0162	0.1363	*	0.0617	0.5607		0.0312	0.4038	*	0.0699	0.9807	
Manganese	µg/m³	2,500	0.0521	--	0.051	--	--	0.0051	0.0335		0.0025	0.0225		0.0012	0.0255	*	0.0025	0.0227		0.0012	0.0166	*	0.0025	0.0350	
Mercury	µg/m³	1,000	0.313	--	0.31	--	1.8	0.003	0.0000	*	0.003	0.0000	*	0.0027	0.0000	*	0.0027	0.0000	*	0.0021	0.0000	*	0.0021	0.0000	*
Molybdenum	µg/m³	--	--	--	--	--	--	0.0033	0.0180	*	0.0043	0.0391		0.0027	0.0000	*	0.003	0.0188	*	0.003	0.0134	*	0.003	0.0238	*
Nickel	µg/m³	5,000	0.0079	--	0.008	--	6	0.0024	0.0000	*	0.0024	0.0000	*	0.0021	0.0277	*	0.0021	0.0000	*	0.0021	0.0300	*	0.0018	0.0059	*
Palladium	µg/m³	--	--	--	--	--	--	0.0033	0.0056	*	0.0033	0.0008	*	0.0024	0.0022	*	0.0024	0.0000	*	0.0018	0.0095	*	0.0018	0.0040	*
Phosphorus	µg/m³	--	--	--	--	--	--	0.0063	0.0000	*	0.0057	0.0000	*	0.0045	0.0000	*	0.0054	0.0000	*	0.0033	0.0024	*	0.0036	0.0000	*
Potassium	µg/m³	--	--	--	--	--	--	0.2087	1.376		0.1059	0.9558		0.0373	0.8785		0.1360	1.237		0.0756	1.268		0.1203	1.688	
Rubidium	µg/m³	--	--	--	--	--	--	0.0015	0.0068	*	0.0015	0.0004	*	0.0012	0.0000	*	0.0012	0.0004	*	0.0012	0.0000	*	0.0012	0.0000	*
Selenium	µg/m³	500	18.3	--	--	--	--	0.0035	0.0233		0.0012	0.0119	*	0.0009	0.0000	*	0.0022	0.0197		0.0009	0.0000	*	0.0009	0.0000	*
Silicon	µg/m³	--	--	--	--	--	--	1.2200	8.043		0.5358	4.834		0.1682	3.958		0.8696	7.906		0.2477	4.157		0.7364	10.34	
Silver	µg/m³	--	--	--	--	--	--	0.0033	0.0000	*	0.0033	0.0000	*	0.0024	0.0000	*	0.0024	0.0000	*	0.0018	0.0103	*	0.0018	0.0106	*
Sodium	µg/m³	--	--	--	--	--	--	0.1113	0.6066	*	0.0405	0.0000	*	0.0312	0.2426	*	0.1840	1.673		0.0963	1.247	*	0.039	0.2637	*
Strontium	µg/m³	--	--	--	--	--	--	0.0027	0.0177		0.0018	0.0119	*	0.0015	0.0033	*	0.0036	0.0330		0.0012	0.0134	*	0.0015	0.0059	*
Sulfur	µg/m³	--	--	--	--	--	--	0.4327	2.853		0.3824	3.450		0.0924	2.174		0.1960	1.781		0.2993	5.023		0.2206	3.096	
Tin	µg/m³	--	--	--	--	--	--	0.0042	0.0146	*	0.0042	0.0068	*	0.003	0.0343	*	0.003	0.0141	*	0.0088	0.1478		0.0086	0.1209	
Titanium	µg/m³	--	--	--	31	--	--	0.0258	0.1704		0.0189	0.1704		0.0045	0.1052		0.0237	0.2153		0.0083	0.1391		0.0319	0.4474	
Vanadium	µg/m³	--	--	--	--	--	--	0.0015	0.0000	*	0.0015	0.0000	*	0.0009	0.0000	*	0.0015	0.0000	*	0.0012	0.0079	*	0.0018	0.0000	*
Yttrium	µg/m³	--	--	--	--	--	--	0.0018	0.0000	*	0.0021	0.0000	*	0.0015	0.0011	*	0.0018	0.0000	*	0.0018	0.0000	*	0.0018	0.0000	*
Zinc	µg/m³	--	--	--	--	--	--	0.0198	0.1307		0.0129	0.1168		0.0025	0.0587		0.0104	0.0942		0.0130	0.2181		0.0130	0.1824	
Zirconium	µg/m³	--	--	--	--	--	--	0.0021	0.0106	*	0.0024	0.0000	*	0.0018	0.0044	*	0.0021	0.0017	*	0.0021	0.0000	*	0.0021	0.0059	*

Table Notes:

[1] Arizona Department of Environmental Quality Acute and Chronic Ambient Air Concentrations, Title 18 Chapter 2 Article 17, December 2007
[2] Arizona Department of Environmental Quality Ambient Air Quality Standards, Title 18 Chapter 2 Article 2, December 2007
[3] EPA Region IX Preliminary Remediation Goals, Ambient Air, October 2004
[4] EPA National Ambient Air Quality Standards, http://www.epa.gov/air/criteria.html, February 2008
[5] California Acute Reference Exposure Levels, March 1999
[6] With the exception of arsenic, the averaging time for all listed analytes is one hour. The averaging time for arsenic is four hours.
[7] The averaging time for the criteria is 24 hours.
[8] The averaging time for the criteria is the annual arithmetic mean.
[9] The averaging time for the criteria is the quarterly average.
[10] Only the PM10 fraction is being measured not the total suspended particulates.
[11] On May 20, 2008, EPA proposed to revise the National Ambient Air Quality (NAAQS) for lead to within the range of 0.1-0.3 mg/m³.
[12] Percent of Total Mass
[13] Precipitation measurements are recorded manually by a Hayden-Winkelman High School employee; reliability cannot be verified.
[14] Bold values with bold outline indicate the result exceeds one or more of the comparison criteria.
[15] Bold italicized values indicate the non-detected result exceeds one or more of the comparison criteria.
[16] * = The result is less than three times the level of uncertainty which is shown in place of the result.
[17] -- = Not established
[18] ºC = Degrees Celsius
[19] % = Percent
[20] J = Estimated value
[21] mph = miles per hour
[22] NA = Not Applicable or Not Analyzed
[23] NPR = No precipitation recorded.
[24] µg/m³ = Micrograms per cubic meter
[25] PM_{10} = particulate matter with a diameter less than or equal to 10 microns in size
[26] R = Rejected
[27] This table should be considered preliminary and will be revised based on incoming data, final data validation and QA/QC.

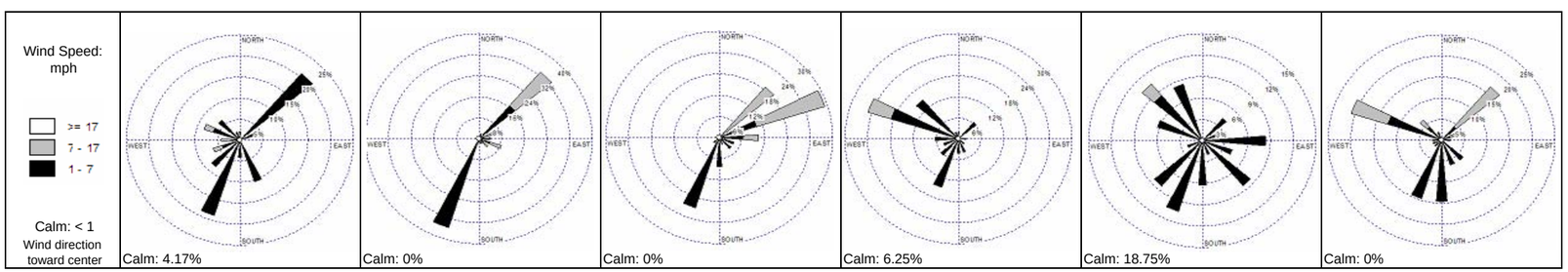

TABLE 4-32

PM_{10} Air Filter Sampling Laboratory Values for Inorganic Parameters

Winkelman Monitoring Station

Remedial Investigation Report

ASARCO LLC Hayden, Arizona Plant Site

The data in this table are illustrated on figures 2-6, 4-55, 4-56, 4-57, 4-58, 4-59, and 4-60.

Date:								02/01/07			02/07/07			02/13/07			02/19/07			02/25/07			03/03/07		
Avg Wind Speed (mph):								1.93			3.04			4.47			6.52			3.79			10.19		
Avg Wind Direction (degrees):								5			16			306			301			303			52		
Avg Ambient Temperature (ºC):								7.9			15.5			11.5			12.3			10.2			11.6		
Avg Ambient Relative Humidity (%):								51			18.5			40.7			35.8			15.1			8.3		
Precipitation (inches)[13]:								NPR			NPR			2/13 - 0.10			2/14 - 0.13			2/20 - 0.31			NPR		
Parameter	Units	Arizona Hazardous Air Pollutants Ambient Air Concentrations (Acute)[1]	Arizona Hazardous Air Pollutants Ambient Air Concentrations (Chronic)[1]	Arizona Ambient Air Quality Standards[2]	EPA Region IX Preliminary Remediation Goal[3]	EPA National Ambient Air Quality Standards[4]	California Acute Reference Exposure Levels[5 6]	Result	Percent[12]	Qual	Result	Percent[12]	Qual	Result	Percent[12]	Qual	Result	Percent[12]	Qual	Result	Percent[12]	Qual	Result	Percent[12]	Qual
PM_{10}	µg/m³	--	--	150 [7]/50 [8]	--	150 [7]	--	6.45	NA		8.82	NA		11.02	NA		22.70	NA		8.60	NA		7.25	NA	
Aluminum	µg/m³	--	--	--	5.1	--	--	0.0683	1.079		0.2477	2.914		0.2252	2.103		0.7251	3.302		0.2500	2.970		0.1911	2.682	
Antimony	µg/m³	13,000	1.46	--	--	--	--	0.0027	0.0275	*	0.0027	0.0194	*	0.0024	0.0084	*	0.0027	0.0116	*	0.0024	0.0000	*	0.0024	0.0000	*
Arsenic	µg/m³	2,500	0.000441	--	0.00045	--	0.19	***0.0021***	0.0342	*	**0.0070**	0.0825		**0.0141**	0.1319		**0.0263**	0.1196		**0.0079**	0.0934		***0.0018***	0.0132	*
Barium	µg/m³	--	--	--	0.52	--	--	0.0045	0.0000	*	0.0051	0.0000	*	0.0054	0.0325	*	0.0171	0.0778		0.0051	0.0386	*	0.0048	0.0000	*
Bismuth	µg/m³	--	--	--	--	--	--	NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA	
Bromine	µg/m³	--	--	--	--	--	--	0.0020	0.0320		0.0009	0.0111	*	0.0022	0.0202		0.0015	0.0069		0.0011	0.0134		0.0009	0.0073	*
Cadmium	µg/m³	250	0.00105	--	0.0011	--	--	***0.0018***	0.0000	*	***0.0018***	0.0127	*	***0.0018***	0.0040	*	**0.0024**	0.0111		***0.0018***	0.0000	*	***0.0018***	0.0000	*
Calcium	µg/m³	--	--	--	--	--	--	0.1445	2.281		0.2000	2.353		0.2274	2.123		0.6742	3.071		0.2661	3.161		0.1913	2.685	
Chlorine	µg/m³	--	--	--	--	--	--	0.0132	0.2089		0.0072	0.0000	*	0.1098	1.025		0.1111	0.5060		0.0051	0.0000	*	0.0051	0.0000	*
Chromium	µg/m³	100	0.000158	--	0.00016	--	--	***0.0009***	0.0126	*	***0.0009***	0.0055	*	***0.0009***	0.0044	*	**0.0017**	0.0077		***0.0009***	0.0000	*	***0.0009***	0.0026	*
Cobalt	µg/m³	10,000	0.000686	--	0.00069	--	--	***0.0048***	0.0000	*	***0.0057***	0.0000	*	***0.006***	0.0000	*	***0.0174***	0.0000	*	***0.0048***	0.0000	*	***0.0042***	0.0000	*
Copper	µg/m³	--	--	--	--	--	100	0.2002	3.161		0.2089	2.457		0.309	2.885		0.8743	3.982		0.1078	1.281		0.0574	0.8055	
Gallium	µg/m³	--	--	--	--	--	--	0.0015	0.0000	*	0.0015	0.0000	*	0.0015	0.0000	*	0.0018	0.0000	*	0.0015	0.0000	*	0.0012	0.0000	*
Germanium	µg/m³	--	--	--	--	--	--	0.0012	0.0000	*	0.0012	0.0000	*	0.0012	0.0000	*	0.0012	0.0000	*	0.0012	0.0000	*	0.0012	0.0000	*
Indium	µg/m³	--	--	--	--	--	--	0.0018	0.0171	*	0.0021	0.0133	*	0.0018	0.0000	*	0.0021	0.0064	*	0.0018	0.0000	*	0.0018	0.0000	*
Iron	µg/m³	--	--	--	--	--	--	0.2044	3.227		0.2466	2.901		0.2772	2.589		0.8569	3.902		0.2256	2.681		0.1734	2.433	
Lanthanum	µg/m³	--	--	--	--	--	--	0.0048	0.0000	*	0.0084	0.0282	*	0.0081	0.0000	*	0.015	0.0000	*	0.0081	0.0028	*	0.0075	0.0000	*
Lead	µg/m³	--	--	1.5 [9,0,11]	--	1.5 [9,0,11]	--	0.0051	0.0803		0.0140	0.1645		0.0329	0.3073		0.0525	0.2393		0.0097	0.1147		0.0030	0.0416	
Magnesium	µg/m³	--	--	--	--	--	--	0.0159	0.2193	*	0.0354	0.3124	*	0.0468	0.4371		0.1633	0.7438		0.0354	0.2970	*	0.0318	0.2749	*
Manganese	µg/m³	2,500	0.0521	--	0.051	--	--	0.0012	0.0164	*	0.0020	0.0233		0.002	0.0189		0.0113	0.0512		0.0032	0.0386		0.0024	0.0337	
Mercury	µg/m³	1,000	0.313	--	0.31	--	1.8	0.0021	0.0000	*	0.0021	0.0000	*	0.0024	0.0000	*	0.0024	0.0000	*	0.0021	0.0000	*	0.0021	0.0000	*
Molybdenum	µg/m³	--	--	--	--	--	--	0.003	0.0141	*	0.0036	0.0427		0.0047	0.0440		0.0107	0.0489		0.003	0.0000	*	0.0027	0.0000	*
Nickel	µg/m³	5,000	0.0079	--	0.008	--	6	0.0018	0.0000	*	0.0018	0.0000	*	0.0021	0.0110	*	0.0024	0.0062	*	0.0021	0.0000	*	0.0018	0.0046	*
Palladium	µg/m³	--	--	--	--	--	--	0.0018	0.0059	*	0.0018	0.0000	*	0.0015	0.0000	*	0.0018	0.0011	*	0.0015	0.0000	*	0.0015	0.0000	*
Phosphorus	µg/m³	--	--	--	--	--	--	0.0033	0.0000	*	0.0036	0.0000	*	0.0039	0.0000	*	0.0048	0.0000	*	0.0036	0.0000	*	0.0033	0.0000	*
Potassium	µg/m³	--	--	--	--	--	--	0.0481	0.7590		0.1010	1.188		0.131	1.223		0.3087	1.406		0.1277	1.518		0.0800	1.123	
Rubidium	µg/m³	--	--	--	--	--	--	0.0012	0.0000	*	0.0012	0.0000	*	0.0012	0.0000	*	0.0012	0.0002	*	0.0012	0.0000	*	0.0009	0.0059	*
Selenium	µg/m³	500	18.3	--	--	--	--	0.0009	0.0082	*	0.0012	0.0022	*	0.0057	0.0536		0.007	0.0319		0.0009	0.0084	*	0.0009	0.0013	*
Silicon	µg/m³	--	--	--	--	--	--	0.2135	3.371		0.6789	7.988		0.686	6.406		1.975	8.995		0.7015	8.335		0.5353	7.514	
Silver	µg/m³	--	--	--	--	--	--	0.0018	0.0149	*	0.0018	0.0083	*	0.0018	0.0053	*	0.0019	0.0088		0.0018	0.0000	*	0.0018	0.0000	*
Sodium	µg/m³	--	--	--	--	--	--	0.0963	1.060	*	0.0396	0.1429	*	0.2018	1.885		0.2397	1.092		0.0951	1.388	*	0.0375	0.2247	*
Strontium	µg/m³	--	--	--	--	--	--	0.0015	0.0000	*	0.0015	0.0144	*	0.0015	0.0136		0.0024	0.0107		0.0018	0.0213		0.0016	0.0231	
Sulfur	µg/m³	--	--	--	--	--	--	0.1917	3.027		0.3220	3.789		0.406	3.791		0.5998	2.732		0.1367	1.625		0.1777	2.495	
Tin	µg/m³	--	--	--	--	--	--	0.0099	0.1569		0.0116	0.1368		0.0094	0.0879		0.01	0.0457		0.0027	0.0129	*	0.0024	0.0000	*
Titanium	µg/m³	--	--	--	31	--	--	0.0084	0.1331		0.0206	0.2421		0.0193	0.1798		0.0591	0.2693		0.0191	0.2271		0.0174	0.2438	
Vanadium	µg/m³	--	--	--	--	--	--	0.0012	0.0000	*	0.0015	0.0000	*	0.0015	0.0000	*	0.003	0.0000	*	0.0012	0.0000	*	0.0012	0.0000	*
Yttrium	µg/m³	--	--	--	--	--	--	0.0018	0.0000	*	0.0018	0.0000	*	0.0015	0.0000	*	0.0018	0.0000	*	0.0015	0.0000	*	0.0015	0.0000	*
Zinc	µg/m³	--	--	--	--	--	--	0.0148	0.2342		0.0159	0.1872		0.0137	0.1275		0.0291	0.1323		0.0065	0.0766		0.0022	0.0304	
Zirconium	µg/m³	--	--	--	--	--	--	0.0021	0.0067	*	0.0021	0.0000	*	0.0021	0.0000	*	0.0024	0.0109		0.0021	0.0017	*	0.0018	0.0040	*

Table Notes:

[1] Arizona Department of Environmental Quality Acute and Chronic Ambient Air Concentrations, Title 18 Chapter 2 Article 17, December 2007
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[13] Precipitation measurements are recorded manually by a Hayden-Winkelman High School employee; reliability cannot be verified.
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[17] -- = Not established
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[21] mph = miles per hour
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[23] NPR = No precipitation recorded.
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[26] R = Rejected
[27] This table should be considered preliminary and will be revised based on incoming data, final data validation and QA/QC.

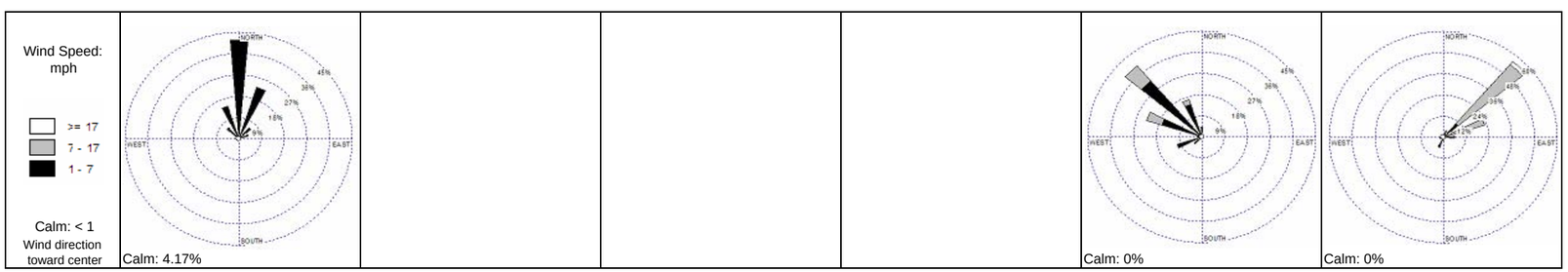

TABLE 4-32

PM_{10} Air Filter Sampling Laboratory Values for Inorganic Parameters

Winkelman Monitoring Station

Remedial Investigation Report

ASARCO LLC Hayden, Arizona Plant Site

The data in this table are illustrated on figures 2-6, 4-55, 4-56, 4-57, 4-58, 4-59, and 4-60.

Date:								03/09/07			03/15/07			03/21/07			03/27/07			04/02/07			04/08/07		
Avg Wind Speed (mph):								3.36			3.54			6.34			8.26			3.73			5.90		
Avg Wind Direction (degrees):								15			314			182			272			286			271		
Avg Ambient Temperature (ºC):								19.7			21.6			20.2			18.9			22			23.3		
Avg Ambient Relative Humidity (%):								13.4			8.7			13.1			19.9			11.2			12.6		
Precipitation (inches)[13]:								NPR			NPR			NPR			3/26 - 0.57			NPR			NPR		
Parameter	**Units**	**Arizona Hazardous Air Pollutants Ambient Air Concentrations (Acute)[1]**	**Arizona Hazardous Air Pollutants Ambient Air Concentrations (Chronic)[1]**	**Arizona Ambient Air Quality Standards[2]**	**EPA Region IX Preliminary Remediation Goal[3]**	**EPA National Ambient Air Quality Standards[4]**	**California Acute Reference Exposure Levels[5 6]**	**Result**	**Percent[12]**	**Qual**	**Result**	**Percent[12]**	**Qual**	**Result**	**Percent[12]**	**Qual**	**Result**	**Percent[12]**	**Qual**	**Result**	**Percent[12]**	**Qual**	**Result**	**Percent[12]**	**Qual**
PM_{10}	µg/m³	--	--	150 [7]/50 [8]	--	150 [7]	--	15.99	NA		17.69	NA		25.40	NA		**82.41**	NA		15.56	NA		43.09	NA	
Aluminum	µg/m³	--	--	--	5.1	--	--	0.5415	3.580		0.5212	12.51		0.7293	17.50		4.0920	5.266		0.3382	2.319		1.4650	3.6590	
Antimony	µg/m³	13,000	1.46	--	--	--	--	0.0024	0.0000	*	0.0024	0.0000	*	0.0024	0.0000	*	0.003	0.0000	*	0.0024	0.0000	*	0.0024	0.0000	*
Arsenic	µg/m³	2,500	0.000441	--	0.00045	--	0.19	**0.0089**	0.0585		**0.0089**	0.0532	J	**0.0153**	0.0639		**0.0046**	0.0059		**0.0073**	0.0500		**0.0065**	0.0161	
Barium	µg/m³	--	--	--	0.52	--	--	0.0072	0.0433	*	0.0089	0.0538		0.0140	0.0588		0.0452	0.0582		0.0063	0.0291	*	0.0111	0.0262	*
Bismuth	µg/m³	--	--	--	--	--	--	NA	NA		NA	NA		NA	NA		NA	NA		NA	NA				
Bromine	µg/m³	--	--	--	--	--	--	0.0023	0.0149		0.0046	0.0275		0.0012	0.0010	*	0.0028	0.0036		0.0023	0.0155		0.0083	0.0208	
Cadmium	µg/m³	250	0.00105	--	0.0011	--	--	***0.0018***	0.0009	*	***0.0018***	0.0014	*	***0.0018***	0.0002	*	***0.0021***	0.0000	*	***0.0018***	0.0065	*	0.0018	0.0018	*
Calcium	µg/m³	--	--	--	--	--	--	0.4977	3.290		0.4784	2.877		0.6455	2.704		3.1200	4.015		0.3802	2.607		0.8659	2.1620	
Chlorine	µg/m³	--	--	--	--	--	--	0.0084	0.0000	*	0.0114	0.0000	*	0.0242	0.1014		0.1547	0.1990		0.0084	0.0129	*	0.2864	0.7153	
Chromium	µg/m³	100	0.000158	--	0.00016	--	--	***0.0009***	0.0031	*	***0.0009***	0.0025	*	***0.0012***	0.0045	*	**0.0056**	0.0072		***0.0009***	0.0032	*	***0.0012***	0.0008	*
Cobalt	µg/m³	10,000	0.000686	--	0.00069	--	--	***0.0093***	0.0000	*	***0.0099***	0.0000	*	***0.015***	0.0000	*	***0.0591***	0.0000	*	***0.0078***	0.0000	*	0.0153	0.0000	*
Copper	µg/m³	--	--	--	--	--	100	0.2462	1.628		0.2520	1.516		0.5415	2.268		0.3544	0.4561		0.2333	1.600		0.0735	0.1837	
Gallium	µg/m³	--	--	--	--	--	--	0.0015	0.0000	*	0.0012	0.0000	*	0.0015	0.0000	*	0.0015	0.0000	*	0.0015	0.0000	*	0.0015	0.0000	*
Germanium	µg/m³	--	--	--	--	--	--	0.0012	0.0000	*	0.0012	0.0000	*	0.0012	0.0000	*	0.0015	0.0000	*	0.0012	0.0000	*	0.0015	0.0000	*
Indium	µg/m³	--	--	--	--	--	--	0.0021	0.0037	*	0.0018	0.0000	*	0.0021	0.0000	*	0.0024	0.0000	*	0.0018	0.0010	*	0.0021	0.0022	*
Iron	µg/m³	--	--	--	--	--	--	0.4878	3.225		0.5287	3.180		0.7722	3.234		3.2310	4.158		0.3750	2.572		0.8263	2.0640	
Lanthanum	µg/m³	--	--	--	--	--	--	0.0111	0.0000	*	0.0108	0.0000	*	0.0153	0.0000	*	0.0654	0.0000	*	0.0099	0.0006	*	0.0183	0.0000	*
Lead	µg/m³	--	--	1.5 [9,0,11]	--	1.5 [9,0,11]	--	0.0178	0.1177		0.0185	0.1113		0.0514	0.2154		0.0121	0.0155		0.0170	0.1166		0.0143	0.0356	
Magnesium	µg/m³	--	--	--	--	--	--	0.0633	0.4187		0.0807	1.936		0.0952	2.284		0.5415	0.6968		0.0426	0.2899	*	0.2456	0.6133	
Manganese	µg/m³	2,500	0.0521	--	0.051	--	--	0.0068	0.0451		0.0081	0.0490		0.0108	0.0454		**0.0544**	0.0700		0.0051	0.0349		0.0245	0.0611	
Mercury	µg/m³	1,000	0.313	--	0.31	--	1.8	0.0024	0.0000	*	0.0021	0.0000	*	0.0021	0.0000	*	0.0024	0.0000	*	0.0021	0.0000	*	0.0024	0.0000	*
Molybdenum	µg/m³	--	--	--	--	--	--	0.0033	0.0118	*	0.003	0.0082	*	0.0068	0.0284		0.0053	0.0068		0.003	0.0032	*	0.0033	0.0032	*
Nickel	µg/m³	5,000	0.0079	--	0.008	--	6	0.0021	0.0003	*	0.0021	0.0000	*	0.0024	0.0000	*	0.0027	0.0027	*	0.0021	0.0000	*	0.0024	0.0000	*
Palladium	µg/m³	--	--	--	--	--	--	0.0018	0.0000	*	0.0018	0.0000	*	0.0018	0.0000	*	0.0021	0.0000	*	0.0018	0.0000	*	0.0018	0.0000	*
Phosphorus	µg/m³	--	--	--	--	--	--	0.0045	0.0000	*	0.0048	0.0000	*	0.0051	0.0000	*	0.0204	0.0000	*	0.0042	0.0000	*	0.0066	0.0000	*
Potassium	µg/m³	--	--	--	--	--	--	0.2309	1.527		0.2082	1.253		0.2981	1.249		1.8170	2.339		0.1597	1.095		0.6027	1.5050	
Rubidium	µg/m³	--	--	--	--	--	--	0.0012	0.0056	*	0.0012	0.0023	*	0.0012	0.0000	*	0.0084	0.0108		0.0012	0.0000	*	0.0015	0.0033	*
Selenium	µg/m³	500	18.3	--	--	--	--	0.0012	0.0034	*	0.0017	0.0102	J	0.0035	0.0146		0.0022	0.0028		0.0009	0.0039	*	0.0012	0.0022	*
Silicon	µg/m³	--	--	--	--	--	--	1.5120	9.996		1.4040	33.70		1.9740	47.37		10.4300	13.43		0.9996	6.854		3.4550	8.6300	
Silver	µg/m³	--	--	--	--	--	--	0.0018	0.0068	*	0.0018	0.0003	*	0.0018	0.0043	*	0.0021	0.0016	*	0.0018	0.0039	*	0.0018	0.0006	*
Sodium	µg/m³	--	--	--	--	--	--	0.0477	0.1759	*	0.1224	2.068	*	0.1413	2.570	*	0.5856	0.4159	*	0.0465	0.0497	*	0.4156	1.0380	
Strontium	µg/m³	--	--	--	--	--	--	0.0036	0.0237		0.0031	0.0187		0.0047	0.0197		0.0211	0.0271		0.0025	0.0171		0.0060	0.0149	
Sulfur	µg/m³	--	--	--	--	--	--	0.3697	2.445		0.5895	3.546		0.4174	1.748		0.5970	0.7683		0.3562	2.443		0.5612	1.4020	
Tin	µg/m³	--	--	--	--	--	--	0.0027	0.0062	*	0.003	0.0119	*	0.0027	0.0024	*	0.0033	0.0040	*	0.0032	0.0223		0.003	0.0040	*
Titanium	µg/m³	--	--	--	31	--	--	0.0388	0.2565		0.0369	0.2218		0.0627	0.2625		0.3327	0.4282		0.0323	0.2215		0.0807	0.2014	
Vanadium	µg/m³	--	--	--	--	--	--	0.0021	0.0000	*	0.0021	0.0000	*	0.003	0.0000	*	0.0141	0.0000	*	0.0018	0.0000	*	0.0033	0.0020	*
Yttrium	µg/m³	--	--	--	--	--	--	0.0018	0.0000	*	0.0015	0.0000	*	0.0018	0.0000	*	0.0027	0.0035		0.0015	0.0000	*	0.0018	0.0000	*
Zinc	µg/m³	--	--	--	--	--	--	0.0148	0.0977		0.0151	0.0909		0.0379	0.1588		0.0217	0.0279		0.0104	0.0714		0.0129	0.0321	
Zirconium	µg/m³	--	--	--	--	--	--	0.0021	0.0106	*	0.0021	0.0105	*	0.0021	0.0034	*	0.0096	0.0124		0.0021	0.0061	*	0.0034	0.0086	

Table Notes:

[1] Arizona Department of Environmental Quality Acute and Chronic Ambient Air Concentrations, Title 18 Chapter 2 Article 17, December 2007
[2] Arizona Department of Environmental Quality Ambient Air Quality Standards, Title 18 Chapter 2 Article 2, December 2007
[3] EPA Region IX Preliminary Remediation Goals, Ambient Air, October 2004
[4] EPA National Ambient Air Quality Standards, http://www.epa.gov/air/criteria.html, February 2008
[5] California Acute Reference Exposure Levels, March 1999
[6] With the exception of arsenic, the averaging time for all listed analytes is one hour. The averaging time for arsenic is four hours.
[7] The averaging time for the criteria is 24 hours.
[8] The averaging time for the criteria is the annual arithmetic mean.
[9] The averaging time for the criteria is the quarterly average.
[10] Only the PM10 fraction is being measured not the total suspended particulates.
[11] On May 20, 2008, EPA proposed to revise the National Ambient Air Quality (NAAQS) for lead to within the range of 0.1-0.3 mg/m³.
[12] Percent of Total Mass
[13] Precipitation measurements are recorded manually by a Hayden-Winkelman High School employee; reliability cannot be verified.
[14] Bold values with bold outline indicate the result exceeds one or more of the comparison criteria.
[15] Bold italicized values indicate the non-detected result exceeds one or more of the comparison criteria.
[16] * = The result is less than three times the level of uncertainty which is shown in place of the result.
[17] -- = Not established
[18] ºC = Degrees Celsius
[19] % = Percent
[20] J = Estimated value
[21] mph = miles per hour
[22] NA = Not Applicable or Not Analyzed
[23] NPR = No precipitation recorded.
[24] µg/m³ = Micrograms per cubic meter
[25] PM_{10} = particulate matter with a diameter less than or equal to 10 microns in size
[26] R = Rejected
[27] This table should be considered preliminary and will be revised based on incoming data, final data validation and QA/QC.

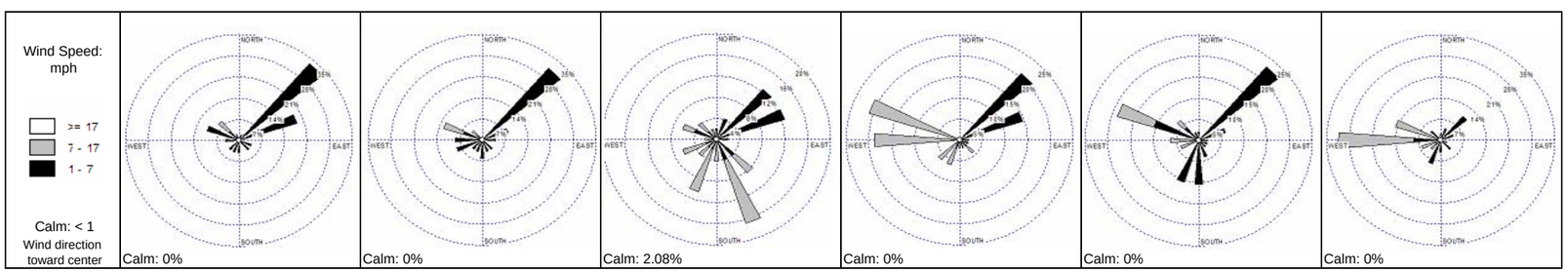

TABLE 4-32

PM_{10} Air Filter Sampling Laboratory Values for Inorganic Parameters

Winkelman Monitoring Station

Remedial Investigation Report

ASARCO LLC Hayden, Arizona Plant Site

The data in this table are illustrated on figures 2-6, 4-55, 4-56, 4-57, 4-58, 4-59, and 4-60.

Date:		Arizona Hazardous Air Pollutants Ambient Air Concentrations (Acute)[1]	Arizona Hazardous Air Pollutants Ambient Air Concentrations (Chronic)[1]	Arizona Ambient Air Quality Standards[2]	EPA Region IX Preliminary Remediation Goal[3]	EPA National Ambient Air Quality Standards[4]	California Acute Reference Exposure Levels[5 6]	04/14/07			04/20/07			04/26/07			05/02/07			05/08/07			05/14/07		
Avg Wind Speed (mph):								2.80			5.90			3.91			4.04			5.03			5.41		
Avg Wind Direction (degrees):								187			249			309			282			50			310		
Avg Ambient Temperature (ºC):								18.9			19.2			23.1			25			23.2			29.7		
Avg Ambient Relative Humidity (%):								18.2			7.4			10.5			10.9			15			6		
Precipitation (inches)[13]:								NPR			NPR			4/26 - 1.80			NPR			NPR			NPR		
Parameter	Units							Result	Percent[12]	Qual	Result	Percent[12]	Qual	Result	Percent[12]	Qual	Result	Percent[12]	Qual	Result	Percent[12]	Qual	Result	Percent[12]	Qual
PM_{10}	µg/m³	--	--	150 [7]/50 [8]	--	150 [7]	--	12.99	NA		35.27	NA		22.62	NA		R	NA		31.15	NA		28.32	NA	
Aluminum	µg/m³	--	--	--	5.1	--	--	0.3415	2.7690		1.2920	3.8970		0.6549	3.1190		R	R		0.8906	2.9690		0.8927	3.4610	
Antimony	µg/m³	13,000	1.46	--	--	--	--	0.0024	0.0050	*	0.0027	0.0000	*	0.0024	0.0000	*	R	R		0.003	0.0070	*	0.0027	0.0024	*J
Arsenic	µg/m³	2,500	0.000441	--	0.00045	--	0.19	**0.0030**	0.0241		**0.0027**	0.0081		**0.0192**	0.0913		R	R		**0.0282**	0.0941		**0.0281**	0.1090	J
Barium	µg/m³	--	--	--	0.52	--	--	0.0051	0.0000	*	0.0135	0.0407		0.0102	0.0487		R	R		0.0195	0.0649		0.0179	0.0694	J
Bismuth	µg/m³	--	--	--	--	--	--							NA	NA		NA	NA		NA	NA		NA	NA	
Bromine	µg/m³	--	--	--	--	--	--	0.0018	0.0149		0.0042	0.0126		0.0026	0.0126		R	R		0.0015	0.0015	*	0.0053	0.0206	
Cadmium	µg/m³	250	0.00105	--	0.0011	--	--	0.0018	0.0000	*	0.0018	0.0000	*	***0.0015***	0.0076	*	R	R		**0.0026**	0.0088		***0.0018***	0.0044	*J
Calcium	µg/m³	--	--	--	--	--	--	0.3172	2.5720		1.1830	3.5660		0.6634	3.1590		R	R		0.9458	3.1530		0.7180	2.7840	
Chlorine	µg/m³	--	--	--	--	--	--	0.0072	0.0000	*	0.3259	0.9826		0.0069	0.0049	*	R	R		0.0168	0.0000	*	0.2188	0.8483	
Chromium	µg/m³	100	0.000158	--	0.00016	--	--	0.0009	0.0004	*	**0.0021**	0.0062		**0.0022**	0.0103		R	R		**0.0029**	0.0098		***0.0012***	0.0000	*J
Cobalt	µg/m³	10,000	0.000686	--	0.00069	--	--	0.0048	0.0000	*	0.0153	0.0000	*	***0.0153***	0.0000	*	R	R		***0.0255***	0.0000	*	***0.0171***	0.0000	*J
Copper	µg/m³	--	--	--	--	--	100	0.0426	0.3455		0.0903	0.2723		0.6959	3.3140		R	R		1.3030	4.3440		R	R	
Gallium	µg/m³	--	--	--	--	--	--	0.0015	0.0000	*	0.0015	0.0000	*	0.0018	0.0000	*	R	R		0.0021	0.0000	*	0.0021	0.0000	*
Germanium	µg/m³	--	--	--	--	--	--	0.0015	0.0000	*	0.0015	0.0000	*	0.0012	0.0000	*	R	R		0.0015	0.0000	*	0.0015	0.0000	*
Indium	µg/m³	--	--	--	--	--	--	0.0021	0.0000	*	0.0021	0.0030	*	0.0018	0.0000	*	R	R		0.0021	0.0000	*	0.0021	0.0000	*
Iron	µg/m³	--	--	--	--	--	--	0.2247	1.8220		0.8207	2.4740		0.7416	3.5310		R	R		1.4610	4.8700		1.0120	3.9230	
Lanthanum	µg/m³	--	--	--	--	--	--	0.0087	0.0107	*	0.0174	0.0000	*	0.0072	0.0000	*	R	R		0.0213	0.0000	*	0.0153	0.0000	*
Lead	µg/m³	--	--	1.5 [9,0,11]	--	1.5 [9,0,11]	--	0.0027	0.0031	*	0.0050	0.0150		0.0479	0.2282		R	R		0.0798	0.2660		0.0699	0.2709	
Magnesium	µg/m³	--	--	--	--	--	--	0.0703	0.5700		0.3056	0.9215		0.1320	0.6287		R	R		0.1066	0.3553		0.1597	0.6192	J
Manganese	µg/m³	2,500	0.0521	--	0.051	--	--	0.0031	0.0252		0.0188	0.0568		0.0100	0.0478		R	R		0.0156	0.0519		0.0141	0.0548	
Mercury	µg/m³	1,000	0.313	--	0.31	--	1.8	0.0024	0.0000	*	0.0024	0.0000	*	0.0024	0.0000	*	R	R		0.0027	0.0000	*	0.0024	0.0000	*
Molybdenum	µg/m³	--	--	--	--	--	--	0.0033	0.0000	*	0.0033	0.0000	*	0.0111	0.0529		R	R		0.0197	0.0657		0.0116	0.0449	
Nickel	µg/m³	5,000	0.0079	--	0.008	--	6	0.0024	0.0000	*	0.0024	0.0048	*	0.0024	0.0000	*	R	R		0.0027	0.0000	*	0.0024	0.0000	*J
Palladium	µg/m³	--	--	--	--	--	--	0.0018	0.0019	*	0.0018	0.0000	*	0.0015	0.0000	*	R	R		0.0018	0.0000	*	0.0018	0.0000	*
Phosphorus	µg/m³	--	--	--	--	--	--	0.0042	0.0000	*	0.006	0.0000	*	0.0036	0.0000	*	R	R		0.006	0.0000	*	0.006	0.0000	*
Potassium	µg/m³	--	--	--	--	--	--	0.1377	1.1160		0.4674	1.4090		0.2546	1.2120		R	R		0.3915	1.3050		0.3361	1.3030	
Rubidium	µg/m³	--	--	--	--	--	--	0.0012	0.0015	*	0.0012	0.0026	*	0.0012	0.0000	*	R	R		0.0015	0.0000	*	0.0015	0.0000	*
Selenium	µg/m³	500	18.3	--	--	--	--	0.0012	0.0004	*	0.0012	0.0000	*	0.0015	0.0070		R	R		0.0036	0.0121		0.0042	0.0162	J
Silicon	µg/m³	--	--	--	--	--	--	0.8800	7.1350		3.0600	9.2260		1.5770	7.5090		R	R		2.4350	8.1160		2.2240	8.6220	
Silver	µg/m³	--	--	--	--	--	--	0.0018	0.0019	*	0.0018	0.0030	*	0.0015	0.0011	*	R	R		0.0021	0.0022	*	0.0018	0.0035	*J
Sodium	µg/m³	--	--	--	--	--	--	0.0474	0.1306	*	0.2798	0.8437		0.1713	0.3991	*	R	R		0.1842	0.2924	*	0.3842	1.4900	
Strontium	µg/m³	--	--	--	--	--	--	0.0022	0.0176		0.0075	0.0227		0.0038	0.0179		R	R		0.0080	0.0265		0.0071	0.0276	
Sulfur	µg/m³	--	--	--	--	--	--	0.3075	2.4930		0.6347	1.9140		0.5518	2.6280		R	R		0.8313	2.7710		0.8635	3.3480	
Tin	µg/m³	--	--	--	--	--	--	0.0027	0.0069	*	0.0027	0.0009	*	0.003	0.0045	*	R	R		0.0033	0.0071	*	0.003	0.0086	*
Titanium	µg/m³	--	--	--	31	--	--	0.0211	0.1714		0.0758	0.2286		0.0427	0.2031		R	R		0.0973	0.3242		0.0576	0.2233	
Vanadium	µg/m³	--	--	--	--	--	--	0.0012	0.0000	*	0.0033	0.0000	*	0.0024	0.0000	*	R	R		0.0039	0.0000	*	0.0027	0.0027	*J
Yttrium	µg/m³	--	--	--	--	--	--	0.0018	0.0000	*	0.0018	0.0037	*	0.0015	0.0000	*	R	R		0.0021	0.0000	*	0.0021	0.0000	*
Zinc	µg/m³	--	--	--	--	--	--	0.0021	0.0080	*	0.0109	0.0329		0.0322	0.1531		R	R		0.0798	0.2660		0.0621	0.2408	
Zirconium	µg/m³	--	--	--	--	--	--	0.0024	0.0000	*	0.0024	0.0075	*	0.0018	0.0043	*	R	R		0.0027	0.0050	*	0.0030	0.0117	

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[25] PM_{10} = particulate matter with a diameter less than or equal to 10 microns in size
[26] R = Rejected
[27] This table should be considered preliminary and will be revised based on incoming data, final data validation and QA/QC.

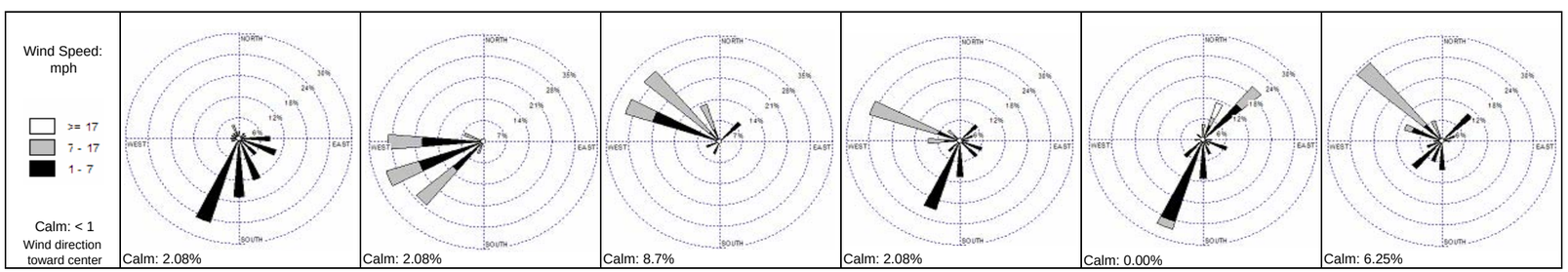

TABLE 4-32

PM_{10} Air Filter Sampling Laboratory Values for Inorganic Parameters

Winkelman Monitoring Station

Remedial Investigation Report

ASARCO LLC Hayden, Arizona Plant Site

The data in this table are illustrated on figures 2-6, 4-55, 4-56, 4-57, 4-58, 4-59, and 4-60.

Date:								05/20/07			05/26/07			06/01/07			06/07/07			6/13/07			6/19/07		
Avg Wind Speed (mph):								5.03			4.60			4.41			5.53			3.85			4.54		
Avg Wind Direction (degrees):								261			304			296			279			293			312		
Avg Ambient Temperature (ºC):								28.7			28.6			28.8			25.3			29.6			32.6		
Avg Ambient Relative Humidity (%):								10.2			6.6			6			7.7			12.2			6		
Precipitation (inches)[13]:								NPR			NPR			NPR			NPR			NPR			NPR		
Parameter	**Units**	**Arizona Hazardous Air Pollutants Ambient Air Concentrations (Acute)[1]**	**Arizona Hazardous Air Pollutants Ambient Air Concentrations (Chronic)[1]**	**Arizona Ambient Air Quality Standards[2]**	**EPA Region IX Preliminary Remediation Goal[3]**	**EPA National Ambient Air Quality Standards[4]**	**California Acute Reference Exposure Levels[5 6]**	**Result**	**Percent[12]**	**Qual**	**Result**	**Percent[12]**	**Qual**	**Result**	**Percent[12]**	**Qual**	**Result**	**Percent[12]**	**Qual**	**Result**	**Percent[12]**	**Qual**	**Result**	**Percent[12]**	**Qual**
PM_{10}	µg/m³	--	--	150 [7]/50 [8]	--	150 [7]	--	23.01	NA		27.58	NA		28.91	NA		42.83	NA		21.33	NA		29.25	NA	
Aluminum	µg/m³	--	--	--	5.1	--	--	0.7896	3.7600		0.8908	3.5280		1.0040	3.8180		1.8420	4.6680		0.7514	3.8620		1.0250	3.8720	
Antimony	µg/m³	13,000	1.46	--	--	--	--	0.0024	0.0000	*	0.0024	0.0002	*	0.0024	0.0000	*	0.0024	0.0000	*	0.0024	0.0000	*	0.0024	0.0011	*
Arsenic	µg/m³	2,500	0.000441	--	0.00045	--	0.19	***0.0036***	0.0135	*	**0.0131**	0.0518		**0.0227**	0.0863		**0.0073**	0.0184		**0.0095**	0.0489		**0.0153**	0.0577	
Barium	µg/m³	--	--	--	0.52	--	--	0.0097	0.0464		0.0119	0.0472		0.0234	0.0892		0.0177	0.0449		0.0100	0.0515		0.0148	0.0559	
Bismuth	µg/m³	--	--	--	--	--	--	NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA	
Bromine	µg/m³	--	--	--	--	--	--	0.0033	0.0157		0.0029	0.0116		0.0053	0.0201		0.0042	0.0106		0.0036	0.0184		0.0016	0.0061	
Cadmium	µg/m³	250	0.00105	--	0.0011	--	--	***0.0018***	0.0000	*	***0.0015***	0.0017	*	**0.0022**	0.0082		***0.0018***	0.0000	*	***0.0015***	0.0015	*	**0.0027**	0.0101	
Calcium	µg/m³	--	--	--	--	--	--	0.6568	3.1280		0.9059	3.5880		1.0370	3.9430		1.5080	3.8220		0.7354	3.7800		0.7726	2.9200	
Chlorine	µg/m³	--	--	--	--	--	--	0.0517	0.2460		0.1217	0.4818		0.0797	0.3030		0.7825	1.9830		0.0363	0.1868		0.1992	0.7529	
Chromium	µg/m³	100	0.000158	--	0.00016	--	--	***0.0012***	0.0000	*	**0.0013**	0.0052		**0.0024**	0.0090		**0.0021**	0.0053		***0.0009***	0.0022	*	***0.0012***	0.0037	*
Cobalt	µg/m³	10,000	0.000686	--	0.00069	--	--	***0.0126***	0.0000	*	***0.0174***	0.0000	*	***0.0201***	0.0000	*	***0.0234***	0.0000	*	***0.0117***	0.0000	*	***0.0177***	0.0000	*
Copper	µg/m³	--	--	--	--	--	100	0.1411	0.6717		0.3725	1.4750		0.7976	3.0340		0.2048	0.5189		0.2158	1.1090		0.6502	2.4580	
Gallium	µg/m³	--	--	--	--	--	--	0.0015	0.0000	*	0.0015	0.0000	*	0.0018	0.0000	*	0.0015	0.0000	*	0.0015	0.0000	*	0.0018	0.0000	*
Germanium	µg/m³	--	--	--	--	--	--	0.0015	0.0000	*	0.0012	0.0000	*	0.0012	0.0000	*	0.0012	0.0000	*	0.0012	0.0000	*	0.0012	0.0000	*
Indium	µg/m³	--	--	--	--	--	--	0.0021	0.0007	*	0.0018	0.0000	*	0.0018	0.0000	*	0.0018	0.0000	*	0.0018	0.0000	*	0.0018	0.0000	*
Iron	µg/m³	--	--	--	--	--	--	0.6738	3.2080		0.9082	3.5970		0.9911	3.7700		1.1520	2.9200		0.5862	3.0130		0.8701	3.2890	
Lanthanum	µg/m³	--	--	--	--	--	--	0.0147	0.0000	*	0.0093	0.0000	*	0.0096	0.0000	*	0.0138	0.0000	*	0.0072	0.0000	*	0.009	0.0000	*
Lead	µg/m³	--	--	1.5 [9,0,11]	--	1.5 [9,0,11]	--	0.0117	0.0558		0.0325	0.1287		0.0724	0.2752		0.0153	0.0387		0.0276	0.1420		0.0573	0.2164	
Magnesium	µg/m³	--	--	--	--	--	--	0.1659	0.7901		0.1770	0.7011		0.1872	0.7118		0.4586	1.1620		0.1290	0.6630		0.1686	0.6372	
Manganese	µg/m³	2,500	0.0521	--	0.051	--	--	0.0119	0.0567		0.0149	0.0589		0.0151	0.0575		0.0210	0.0531		0.0111	0.0571		0.0149	0.0564	
Mercury	µg/m³	1,000	0.313	--	0.31	--	1.8	0.0024	0.0000	*	0.0024	0.0000	*	0.0024	0.0000	*	0.0024	0.0000	*	0.0021	0.0000	*	0.0024	0.0000	*
Molybdenum	µg/m³	--	--	--	--	--	--	0.0033	0.0054	*	0.0037	0.0145		0.0082	0.0312		0.003	0.0060	*	0.0027	0.0060	*	0.0056	0.0210	
Nickel	µg/m³	5,000	0.0079	--	0.008	--	6	0.0024	0.0000	*	0.0024	0.0056	*	0.0024	0.0000	*	0.0024	0.0000	*	0.0021	0.0000	*	0.0024	0.0000	*
Palladium	µg/m³	--	--	--	--	--	--	0.0018	0.0002	*	0.0015	0.0000	*	0.0015	0.0000	*	0.0015	0.0000	*	0.0015	0.0000	*	0.0015	0.0000	*
Phosphorus	µg/m³	--	--	--	--	--	--	0.0054	0.0000	*	0.0042	0.0000	*	0.0045	0.0000	*	0.0096	0.0000	*	0.0039	0.0000	*	0.0042	0.0000	*
Potassium	µg/m³	--	--	--	--	--	--	0.3055	1.4550		0.3737	1.4800		0.4203	1.5990		0.6592	1.6710		0.3320	1.7060		0.4175	1.5780	
Rubidium	µg/m³	--	--	--	--	--	--	0.0018	0.0085		0.0018	0.0071		0.0012	0.0029	*	0.0024	0.0062		0.0021	0.0109		0.0020	0.0075	
Selenium	µg/m³	500	18.3	--	--	--	--	0.0012	0.0000	*	0.0024	0.0095		0.0056	0.0213		0.0012	0.0025	*	0.0029	0.0148		0.0032	0.0119	
Silicon	µg/m³	--	--	--	--	--	--	1.9280	9.1790		2.0260	8.0260		2.3870	9.0790		4.2240	10.7100		1.7600	9.0450		2.5260	9.5490	
Silver	µg/m³	--	--	--	--	--	--	0.0018	0.0000	*	0.0015	0.0004	*	0.0015	0.0039	*	0.0015	0.0007	*	0.0015	0.0041	*	0.0015	0.0012	*
Sodium	µg/m³	--	--	--	--	--	--	0.1809	0.8616		0.3013	1.1930		0.21	0.5602	*	0.6549	1.6600		0.1948	1.0010		0.2034	0.4942	*
Strontium	µg/m³	--	--	--	--	--	--	0.0052	0.0247		0.0061	0.0241		0.0062	0.0236		0.0089	0.0227		0.0046	0.0237		0.0043	0.0162	
Sulfur	µg/m³	--	--	--	--	--	--	0.7990	3.8050		0.8042	3.1850		0.7792	2.9640		0.6615	1.6760		0.6460	3.3200		0.8263	3.1230	
Tin	µg/m³	--	--	--	--	--	--	0.003	0.0067	*	0.0027	0.0000	*	0.0027	0.0000	*	0.003	0.0008	*	0.0024	0.0000	*	0.0027	0.0000	*
Titanium	µg/m³	--	--	--	31	--	--	0.0606	0.2888		0.0626	0.2480		0.0610	0.2321		0.1025	0.2598		0.0440	0.2262		0.0557	0.2103	
Vanadium	µg/m³	--	--	--	--	--	--	0.0027	0.0000	*	0.003	0.0000	*	0.0033	0.0000	*	0.0048	0.0000	*	0.0024	0.0000	*	0.0027	0.0000	*
Yttrium	µg/m³	--	--	--	--	--	--	0.0018	0.0000	*	0.0015	0.0024	*	0.0015	0.0000	*	0.0015	0.0011	*	0.0015	0.0012	*	0.0015	0.0002	*
Zinc	µg/m³	--	--	--	--	--	--	0.0135	0.0643		0.0360	0.1425		0.0628	0.2389		0.0192	0.0487		0.0228	0.1174		0.0386	0.1459	
Zirconium	µg/m³	--	--	--	--	--	--	0.0024	0.0092	*	0.0018	0.0063	*	0.0018	0.0063	*	0.0038	0.0097		0.0020	0.0102		0.0018	0.0046	*

Table Notes:

[1] Arizona Department of Environmental Quality Acute and Chronic Ambient Air Concentrations, Title 18 Chapter 2 Article 17, December 2007
[2] Arizona Department of Environmental Quality Ambient Air Quality Standards, Title 18 Chapter 2 Article 2, December 2007
[3] EPA Region IX Preliminary Remediation Goals, Ambient Air, October 2004
[4] EPA National Ambient Air Quality Standards, http://www.epa.gov/air/criteria.html, February 2008
[5] California Acute Reference Exposure Levels, March 1999
[6] With the exception of arsenic, the averaging time for all listed analytes is one hour. The averaging time for arsenic is four hours.
[7] The averaging time for the criteria is 24 hours.
[8] The averaging time for the criteria is the annual arithmetic mean.
[9] The averaging time for the criteria is the quarterly average.
[10] Only the PM10 fraction is being measured not the total suspended particulates.
[11] On May 20, 2008, EPA proposed to revise the National Ambient Air Quality (NAAQS) for lead to within the range of 0.1-0.3 mg/m³.
[12] Percent of Total Mass
[13] Precipitation measurements are recorded manually by a Hayden-Winkelman High School employee; reliability cannot be verified.
[14] Bold values with bold outline indicate the result exceeds one or more of the comparison criteria.
[15] Bold italicized values indicate the non-detected result exceeds one or more of the comparison criteria.
[16] * = The result is less than three times the level of uncertainty which is shown in place of the result.
[17] -- = Not established
[18] ºC = Degrees Celsius
[19] % = Percent
[20] J = Estimated value
[21] mph = miles per hour
[22] NA = Not Applicable or Not Analyzed
[23] NPR = No precipitation recorded.
[24] µg/m³ = Micrograms per cubic meter
[25] PM_{10} = particulate matter with a diameter less than or equal to 10 microns in size
[26] R = Rejected
[27] This table should be considered preliminary and will be revised based on incoming data, final data validation and QA/QC.

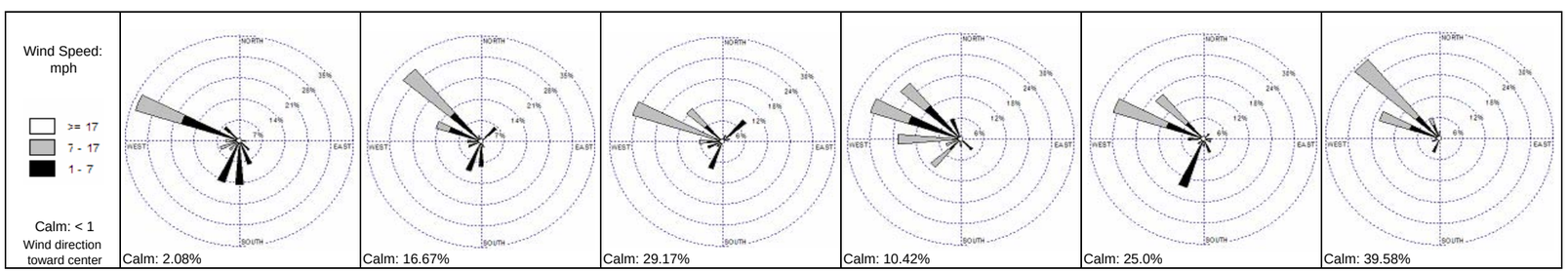

TABLE 4-32

PM_{10} Air Filter Sampling Laboratory Values for Inorganic Parameters

Winkelman Monitoring Station

Remedial Investigation Report

ASARCO LLC Hayden, Arizona Plant Site

The data in this table are illustrated on figures 2-6, 4-55, 4-56, 4-57, 4-58, 4-59, and 4-60.

Date:		Arizona Hazardous Air Pollutants Ambient Air Concentrations (Acute)[1]	Arizona Hazardous Air Pollutants Ambient Air Concentrations (Chronic)[1]	Arizona Ambient Air Quality Standards[2]	EPA Region IX Preliminary Remediation Goal[3]	EPA National Ambient Air Quality Standards[4]	California Acute Reference Exposure Levels[5 6]	6/25/07			7/1/07			7/7/07			7/13/07			7/19/07			7/25/07		
Avg Wind Speed (mph):								3.67			4.60			6.03			4.66			5.97			3.42		
Avg Wind Direction (degrees):								303			296			7			285			290			284		
Avg Ambient Temperature (ºC):								32.6			33.8			35			33.9			34.1			27.2		
Avg Ambient Relative Humidity (%):								5.5			5.3			8.6			12.4			11.8			32.9		
Precipitation (inches)[13]:								NPR			NPR			NPR			NPR			NPR			NPR		
Parameter	**Units**							**Result**	**Percent[12]**	**Qual**	**Result**	**Percent[12]**	**Qual**	**Result**	**Percent[12]**	**Qual**	**Result**	**Percent[12]**	**Qual**	**Result**	**Percent[12]**	**Qual**	**Result**	**Percent[12]**	**Qual**
PM_{10}	µg/m³	--	--	150 [7]/50 [8]	--	150 [7]	--	26.37	NA		24.90	NA		17.90	NA		27.11	NA		27.28	NA		16.22	NA	
Aluminum	µg/m³	--	--	--	5.1	--	--	0.7830	3.2910		0.7091	3.1690		0.4897	3.0520		0.6992	2.8640		0.9426	3.8610		0.4499	3.0160	
Antimony	µg/m³	13,000	1.46	--	--	--	--	0.003	0.0020	*	0.0036	0.0000	*	0.0036	0.0000	*J	0.0036	0.0015	*	0.0036	0.0000	*	0.0033	0.0000	*
Arsenic	µg/m³	2,500	0.000441	--	0.00045	--	0.19	**0.0231**	0.0972		**0.0122**	0.0547		**0.0032**	0.0203	J	**0.0044**	0.0179		***0.0039***	0.0110	*	**0.0023**	0.0152	
Barium	µg/m³	--	--	--	0.52	--	--	0.0104	0.0435		0.0131	0.0585		0.0072	0.0000	*J	0.0097	0.0395		0.0142	0.0582		0.0069	0.0000	*
Bismuth	µg/m³	--	--	--	--	--	--	NA	NA		0.0056	0.0253		NA	NA		0.0026	0.0108		0.0032	0.0131		NA	NA	
Bromine	µg/m³	--	--	--	--	--	--	0.0016	0.0069		0.0057	0.0255		0.0029	0.0182		0.0038	0.0156		0.0021	0.0085		0.0006	0.0041	
Cadmium	µg/m³	250	0.00105	--	0.0011	--	--	**0.0029**	0.0121		***0.0024***	0.0027	*	***0.0024***	0.0000	*J	***0.0024***	0.0029	*	***0.0024***	0.0012	*	***0.0024***	0.0006	*
Calcium	µg/m³	--	--	--	--	--	--	0.7190	3.0220		0.6483	2.8980		0.4378	2.7290		0.6648	2.7230		0.5598	2.2930		0.4473	2.9990	
Chlorine	µg/m³	--	--	--	--	--	--	0.1738	0.7306		0.1078	0.4817		0.0063	0.0367	*	0.0224	0.0918		0.0169	0.0690		0.006	0.0256	*
Chromium	µg/m³	100	0.000158	--	0.00016	--	--	**0.0015**	0.0061		***0.0009***	0.0023	*	***0.0009***	0.0047	*J	**0.0017**	0.0069		***0.0012***	0.0040	*	***0.0009***	0.0009	*
Cobalt	µg/m³	10,000	0.000686	--	0.00069	--	--	***0.0186***	0.0000	*	***0.009***	0.0000	*	***0.0057***	0.0000	*J	***0.0084***	0.0000	*	***0.0096***	0.0000	*	***0.0054***	0.0000	*
Copper	µg/m³	--	--	--	--	--	100	0.9567	4.0210		0.3910	1.7480		0.2072	1.2910	J	0.5490	2.2480		0.4033	1.6520		0.1336	0.8955	
Gallium	µg/m³	--	--	--	--	--	--	0.0018	0.0000	*	0.0009	0.0000	*	0.0006	0.0000	*	0.0006	0.0000	*	0.0009	0.0000	*	0.0006	0.0000	*
Germanium	µg/m³	--	--	--	--	--	--	0.0012	0.0000	*	0.0006	0.0000	*	0.0006	0.0000	*	0.0006	0.0000	*	0.0006	0.0000	*	0.0006	0.0000	*
Indium	µg/m³	--	--	--	--	--	--	0.0024	0.0016	*	0.0027	0.0008	*	0.0027	0.0000	*	0.0027	0.0031	*	0.0027	0.0000	*	0.0027	0.0000	*
Iron	µg/m³	--	--	--	--	--	--	0.9035	3.7980		0.6060	2.7080		0.4540	2.8300		0.6545	2.6800		0.7331	3.0020		0.3824	2.5630	
Lanthanum	µg/m³	--	--	--	--	--	--	0.0081	0.0000	*	0.0129	0.0000	*	0.0114	0.0000	*	0.0135	0.0000	*	0.0153	0.0000	*	0.0111	0.0000	*
Lead	µg/m³	--	--	1.5 [9,0,11]	--	1.5 [9,0,11]	--	0.0830	0.3489		0.0465	0.2079		0.0076	0.0475		0.0256	0.1049		0.0266	0.1090		0.0080	0.0537	
Magnesium	µg/m³	--	--	--	--	--	--	0.1196	0.5027		0.1492	0.6666		0.0666	0.4153		0.1411	0.5777		0.1380	0.5650		0.0839	0.5625	
Manganese	µg/m³	2,500	0.0521	--	0.051	--	--	0.0097	0.0406		0.0102	0.0455		0.0064	0.0399	J	0.0096	0.0391		0.0140	0.0573		0.0061	0.0407	
Mercury	µg/m³	1,000	0.313	--	0.31	--	1.8	0.0021	0.0000	*	0.0012	0.0000	*	0.0012	0.0000	*	0.0012	0.0000	*	0.0012	0.0000	*	0.0012	0.0000	*
Molybdenum	µg/m³	--	--	--	--	--	--	0.0105	0.0441		0.0015	0.0065	*	0.0015	0.0009	*	0.0015	0.0048	*	0.0018	0.0058	*	0.0015	0.0000	*
Nickel	µg/m³	5,000	0.0079	--	0.008	--	6	0.0018	0.0000	*	0.0003	0.0011	*	0.0003	0.0015	*J	0.0003	0.0008	*	0.0006	0.0019	*	0.0003	0.0000	*
Palladium	µg/m³	--	--	--	--	--	--	0.0021	0.0000	*	0.0024	0.0000	*	0.0024	0.0000	*	0.0024	0.0000	*	0.0024	0.0000	*	0.0024	0.0000	*
Phosphorus	µg/m³	--	--	--	--	--	--	0.0048	0.0000	*	0.0057	0.0000	*	0.0042	0.0000	*	0.006	0.0000	*	0.006	0.0000	*	0.0045	0.0041	*
Potassium	µg/m³	--	--	--	--	--	--	0.3415	1.4350		0.4020	1.7970		0.2529	1.5760		0.3511	1.4380		0.3971	1.6270		0.2167	1.4530	
Rubidium	µg/m³	--	--	--	--	--	--	0.0009	0.0000	*	0.0006	0.0032	*	0.0007	0.0041		0.0006	0.0008	*	0.0010	0.0040		0.0007	0.0044	
Selenium	µg/m³	500	18.3	--	--	--	--	0.0028	0.0119		0.0079	0.0354		0.0020	0.0123	J	0.0037	0.0152		0.0028	0.0116		0.0029	0.0196	
Silicon	µg/m³	--	--	--	--	--	--	1.9580	8.2290		1.7930	8.0130		1.2110	7.5520		1.7350	7.1080		2.1700	8.8880		1.0910	7.3130	
Silver	µg/m³	--	--	--	--	--	--	0.0021	0.0026	*	0.0024	0.0023	*	0.0024	0.0150	*J	0.0024	0.0077	*	0.0024	0.0000	*	0.0024	0.0028	*
Sodium	µg/m³	--	--	--	--	--	--	0.4041	1.6980		0.2139	0.9562		0.1266	0.5474	*	0.1782	0.4830	*	0.1899	0.6296	*	0.1134	0.3964	*
Strontium	µg/m³	--	--	--	--	--	--	0.0044	0.0184		0.0032	0.0141		0.0023	0.0141		0.0033	0.0137		0.0044	0.0179		0.0024	0.0161	
Sulfur	µg/m³	--	--	--	--	--	--	0.6912	2.9050		0.5947	2.6580		0.4601	2.8680		0.6869	2.8130		0.6356	2.6030		0.4944	3.3140	
Tin	µg/m³	--	--	--	--	--	--	0.0027	0.0000	*	0.0039	0.0141	*	0.0036	0.0053	*	0.0036	0.0058	*	0.0036	0.0044	*	0.0036	0.0079	*
Titanium	µg/m³	--	--	--	31	--	--	0.0511	0.2147		0.0487	0.2176		0.0400	0.2495		0.0536	0.2194		0.0627	0.2569		0.0417	0.2797	
Vanadium	µg/m³	--	--	--	--	--	--	0.0024	0.0000	*	0.0024	0.0000	*	0.0018	0.0000	*J	0.0024	0.0017	*	0.0027	0.0000	*	0.0018	0.0000	*
Yttrium	µg/m³	--	--	--	--	--	--	0.0015	0.0000	*	0.0009	0.0015	*	0.0009	0.0000	*	0.0009	0.0000	*	0.0009	0.0000	*	0.0009	0.0000	*
Zinc	µg/m³	--	--	--	--	--	--	0.0543	0.2284		0.0901	0.4028		R	R		0.0233	0.0955		0.0292	0.1196		0.0085	0.0571	
Zirconium	µg/m³	--	--	--	--	--	--	0.0015	0.0067	*	0.0013	0.0059		0.0013	0.0082		0.0012	0.0048	*	0.0026	0.0106		0.0012	0.0016	*

Table Notes:

[1] Arizona Department of Environmental Quality Acute and Chronic Ambient Air Concentrations, Title 18 Chapter 2 Article 17, December 2007
[2] Arizona Department of Environmental Quality Ambient Air Quality Standards, Title 18 Chapter 2 Article 2, December 2007
[3] EPA Region IX Preliminary Remediation Goals, Ambient Air, October 2004
[4] EPA National Ambient Air Quality Standards, http://www.epa.gov/air/criteria.html, February 2008
[5] California Acute Reference Exposure Levels, March 1999
[6] With the exception of arsenic, the averaging time for all listed analytes is one hour. The averaging time for arsenic is four hours.
[7] The averaging time for the criteria is 24 hours.
[8] The averaging time for the criteria is the annual arithmetic mean.
[9] The averaging time for the criteria is the quarterly average.
[10] Only the PM10 fraction is being measured not the total suspended particulates.
[11] On May 20, 2008, EPA proposed to revise the National Ambient Air Quality (NAAQS) for lead to within the range of 0.1-0.3 mg/m³.
[12] Percent of Total Mass
[13] Precipitation measurements are recorded manually by a Hayden-Winkelman High School employee; reliability cannot be verified.
[14] Bold values with bold outline indicate the result exceeds one or more of the comparison criteria.
[15] Bold italicized values indicate the non-detected result exceeds one or more of the comparison criteria.
[16] * = The result is less than three times the level of uncertainty which is shown in place of the result.
[17] -- = Not established
[18] ºC = Degrees Celsius
[19] % = Percent
[20] J = Estimated value
[21] mph = miles per hour
[22] NA = Not Applicable or Not Analyzed
[23] NPR = No precipitation recorded.
[24] µg/m³ = Micrograms per cubic meter
[25] PM_{10} = particulate matter with a diameter less than or equal to 10 microns in size
[26] R = Rejected
[27] This table should be considered preliminary and will be revised based on incoming data, final data validation and QA/QC.

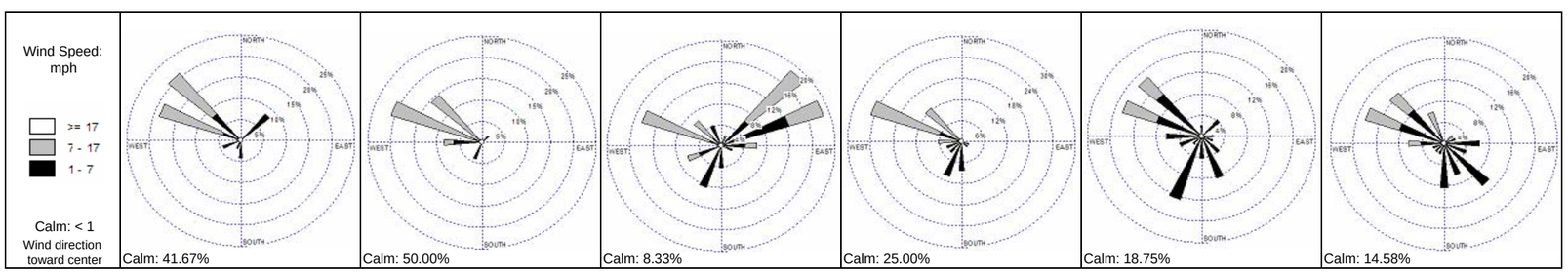

TABLE 4-32

PM_{10} Air Filter Sampling Laboratory Values for Inorganic Parameters

Winkelman Monitoring Station

Remedial Investigation Report

ASARCO LLC Hayden, Arizona Plant Site

The data in this table are illustrated on figures 2-6, 4-55, 4-56, 4-57, 4-58, 4-59, and 4-60.

Date:								8/6/07			8/12/07			8/18/07			8/24/07			8/30/07			9/5/07		
Avg Wind Speed (mph):								4.29			3.29			2.67			3.48			7.83			3.17		
Avg Wind Direction (degrees):								306			291			230			226			76			255		
Avg Ambient Temperature (ºC):								25.5			34.1			32.7			32.4			35.1			30.6		
Avg Ambient Relative Humidity (%):								38.7			13.2			12.7			15.1			6.9			12.4		
Precipitation (inches)[13]:								NPR			NPR			NPR			NPR			NPR			NPR		
Parameter	**Units**	**Arizona Hazardous Air Pollutants Ambient Air Concentrations (Acute)[1]**	**Arizona Hazardous Air Pollutants Ambient Air Concentrations (Chronic)[1]**	**Arizona Ambient Air Quality Standards[2]**	**EPA Region IX Preliminary Remediation Goal[3]**	**EPA National Ambient Air Quality Standards[4]**	**California Acute Reference Exposure Levels[5 6]**	**Result**	**Percent[12]**	**Qual**	**Result**	**Percent[12]**	**Qual**	**Result**	**Percent[12]**	**Qual**	**Result**	**Percent[12]**	**Qual**	**Result**	**Percent[12]**	**Qual**	**Result**	**Percent[12]**	**Qual**
PM_{10}	µg/m³	--	--	150 [7]/50 [8]	--	150 [7]	--	1.53	NA		12.47	NA		21.93	NA		21.81	NA		8.36	NA		25.12	NA	
Aluminum	µg/m³	--	--	--	5.1	--	--	0.0066	0.0000	*	0.1730	1.5430		0.3108	1.5730		0.5758	2.9340		0.1036	1.3820		0.6719	2.9590	
Antimony	µg/m³	13,000	1.46	--	--	--	--	0.0027	0.0000	*	0.0032	0.0281		0.0027	0.0050	*	0.0024	0.0000	*	0.0027	0.0345	*	0.0027	0.0118	
Arsenic	µg/m³	2,500	0.000441	--	0.00045	--	0.19	***0.0012***	0.0000	*	**0.0060**	0.0538		**0.0211**	0.1068		**0.0079**	0.0403		***0.0009***	0.0063	*	***0.0021***	0.0075	*
Barium	µg/m³	--	--	--	0.52	--	--	0.0039	0.0499	*	0.0090	0.0807		0.006	0.0222	*	0.0069	0.0259	*	0.0036	0.0264	*	0.0069	0.0091	*
Bismuth	µg/m³	--	--	--	--	--	--	NA	NA		0.0048	0.0433		0.0106	0.0539		0.0131	0.0667		NA	NA		0.0059	0.0259	
Bromine	µg/m³	--	--	--	--	--	--	0.0009	0.0033	*	0.0009	0.0088	*	0.0018	0.0093		0.0024	0.0120		0.0009	0.0119		0.0018	0.0079	
Cadmium	µg/m³	250	0.00105	--	0.0011	--	--	***0.0018***	0.0000	*	***0.0018***	0.0000	*	***0.0018***	0.0076	*	**0.0024**	0.0122		***0.0021***	0.0000	*	***0.0018***	0.0000	*
Calcium	µg/m³	--	--	--	--	--	--	0.0015	0.0366	*	0.1815	1.6190		0.3713	1.8800		0.4637	2.3630		0.2141	2.8550		0.5603	2.4670	
Chlorine	µg/m³	--	--	--	--	--	--	0.0042	0.1263	*	0.0057	0.0067	*	0.0096	0.0000	*	0.0081	0.0000	*	0.0045	0.0000	*	0.0087	0.0000	*
Chromium	µg/m³	100	0.000158	--	0.00016	--	--	***0.0009***	0.0000	*	***0.0009***	0.0059	*	***0.0009***	0.0014	*	***0.0012***	0.0007	*	***0.0009***	0.0000	*	***0.0012***	0.0000	*
Cobalt	µg/m³	10,000	0.000686	--	0.00069	--	--	***0.0027***	0.0000	*	***0.009***	0.0000	*	***0.0063***	0.0000	*	***0.003***	0.0000	*	***0.0033***	0.0000	*	***0.003***	0.0000	*
Copper	µg/m³	--	--	--	--	--	100	0.0024	0.1695		0.6672	5.9520		0.1837	0.9300		0.3176	1.6180		0.0122	0.1632		0.2216	0.9757	
Gallium	µg/m³	--	--	--	--	--	--	0.0012	0.0000	*	0.0015	0.0000	*	0.0015	0.0000	*	0.0015	0.0000	*	0.0012	0.0000	*	0.0012	0.0000	*
Germanium	µg/m³	--	--	--	--	--	--	0.0012	0.0000	*	0.0012	0.0000	*	0.0012	0.0000	*	0.0012	0.0000	*	0.0009	0.0000	*	0.0012	0.0000	*
Indium	µg/m³	--	--	--	--	--	--	0.0021	0.0000	*	0.0021	0.0034	*	0.0021	0.0000	*	0.0021	0.0019	*	0.0021	0.0000	*	0.0021	0.0035	*
Iron	µg/m³	--	--	--	--	--	--	0.0024	0.1728		0.4633	4.1340		0.3169	1.6050		0.6140	3.1280		0.0818	1.0910		0.6361	2.8010	
Lanthanum	µg/m³	--	--	--	--	--	--	0.0033	0.0964	*	0.0081	0.0223	*	0.0096	0.0000	*	0.0063	0.0000	*	0.0033	0.0013	*	0.0063	0.0000	*
Lead	µg/m³	--	--	1.5 [9,0,11]	--	1.5 [9,0,11]	--	0.0024	0.0000	*	0.0272	0.2428		0.0342	0.1731		0.0257	0.1308		0.0024	0.0044	*	0.0177	0.0778	
Magnesium	µg/m³	--	--	--	--	--	--	0.0123	0.0864	*	0.0471	0.4201		0.0471	0.2208	*	0.0243	0.0883	*	0.0285	0.2430	*	0.0258	0.0686	*
Manganese	µg/m³	2,500	0.0521	--	0.051	--	--	0.0012	0.0000	*	0.0019	0.0168		0.0040	0.0203		0.0096	0.0487		0.0012	0.0157	*	0.0129	0.0568	
Mercury	µg/m³	1,000	0.313	--	0.31	--	1.8	0.0024	0.0000	*	0.0024	0.0000	*	0.0024	0.0000	*	0.0024	0.0000	*	0.0018	0.0000	*	0.0024	0.0000	*
Molybdenum	µg/m³	--	--	--	--	--	--	0.003	0.0000	*	0.003	0.0122	*	0.0027	0.0060	*	0.0049	0.0252		0.0021	0.0000	*	0.0012	0.0027	*
Nickel	µg/m³	5,000	0.0079	--	0.008	--	6	0.0021	0.0000	*	0.0021	0.0000	*	0.0018	0.0000	*	0.0021	0.0000	*	0.0015	0.0019	*	0.0021	0.0000	*
Palladium	µg/m³	--	--	--	--	--	--	0.0018	0.0133	*	0.0018	0.0000	*	0.0018	0.0000	*	0.0015	0.0002	*	0.0018	0.0000	*	0.0015	0.0000	*
Phosphorus	µg/m³	--	--	--	--	--	--	0.0024	0.0000	*	0.0039	0.0181	*	0.0048	0.0000	*	0.0054	0.0000	*	0.003	0.0000	*	0.0057	0.0000	*
Potassium	µg/m³	--	--	--	--	--	--	0.0024	0.1728		0.1009	0.9006		0.1819	0.9212		0.2755	1.4040		0.0617	0.8230		0.2933	1.2920	
Rubidium	µg/m³	--	--	--	--	--	--	0.0012	0.0000	*	0.0009	0.0000	*	0.0012	0.0026	*	0.0014	0.0072		0.0006	0.0000	*	0.0019	0.0083	
Selenium	µg/m³	500	18.3	--	--	--	--	0.0009	0.0133	*	0.0056	0.0500		0.0043	0.0217		0.0024	0.0122		0.0006	0.0050	*	0.0041	0.0182	
Silicon	µg/m³	--	--	--	--	--	--	0.0051	0.0598	*	0.4864	4.3390		0.8094	4.0980		1.4170	7.2190		0.3083	4.1100		1.7110	7.5350	
Silver	µg/m³	--	--	--	--	--	--	0.0018	0.0000	*	0.0020	0.0176		0.0018	0.0024	*	0.0026	0.0134		0.0021	0.0000	*	0.0020	0.0089	
Sodium	µg/m³	--	--	--	--	--	--	0.0297	0.4354	*	0.1215	0.7389	*	0.054	0.0458	*	0.0453	0.0000	*	0.1017	0.9354	*	0.0483	0.0000	*
Strontium	µg/m³	--	--	--	--	--	--	0.0015	0.0000	*	0.0012	0.0046	*	0.0023	0.0114		0.0033	0.0168		0.0010	0.0138		0.0045	0.0197	
Sulfur	µg/m³	--	--	--	--	--	--	0.0018	0.0000	*	0.5090	4.5410		1.5260	7.7290		0.7872	4.0110		0.3568	4.7570		0.8885	3.9120	
Tin	µg/m³	--	--	--	--	--	--	0.0036	0.0997	*	0.0036	0.0160	*	0.0039	0.0134	*	0.0048	0.0000	*	0.0027	0.0000	*	0.0048	0.0000	*
Titanium	µg/m³	--	--	--	31	--	--	0.0009	0.0000	*	0.0173	0.1542		0.0307	0.1554		0.0436	0.2219		0.0086	0.1149		0.0552	0.2432	
Vanadium	µg/m³	--	--	--	--	--	--	0.0009	0.0066	*	0.0012	0.0000	*	0.0015	0.0000	*	0.0018	0.0086	*	0.0009	0.0000	*	0.0028	0.0124	
Yttrium	µg/m³	--	--	--	--	--	--	0.0018	0.0000	*	0.0015	0.0000	*	0.0015	0.0000	*	0.0009	0.0014	*	0.0012	0.0000	*	0.0006	0.0004	*
Zinc	µg/m³	--	--	--	--	--	--	0.0018	0.0000	*	0.0257	0.2294		0.0161	0.0813		0.0186	0.0945		0.0018	0.0239		0.0126	0.0554	
Zirconium	µg/m³	--	--	--	--	--	--	0.0021	0.0499	*	0.0018	0.0046	*	0.0021	0.0010	*	0.0011	0.0055		0.0015	0.0000	*	0.0019	0.0083	

Table Notes:

[1] Arizona Department of Environmental Quality Acute and Chronic Ambient Air Concentrations, Title 18 Chapter 2 Article 17, December 2007
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[3] EPA Region IX Preliminary Remediation Goals, Ambient Air, October 2004
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[10] Only the PM10 fraction is being measured not the total suspended particulates.
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[12] Percent of Total Mass
[13] Precipitation measurements are recorded manually by a Hayden-Winkelman High School employee; reliability cannot be verified.
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[19] % = Percent
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[25] PM_{10} = particulate matter with a diameter less than or equal to 10 microns in size
[26] R = Rejected
[27] This table should be considered preliminary and will be revised based on incoming data, final data validation and QA/QC.

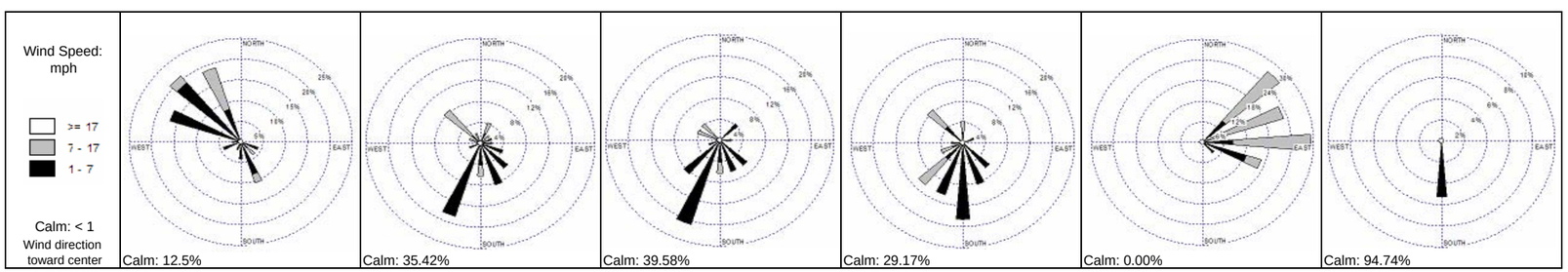

TABLE 4-32

PM_{10} Air Filter Sampling Laboratory Values for Inorganic Parameters

Winkelman Monitoring Station

Remedial Investigation Report

ASARCO LLC Hayden, Arizona Plant Site

The data in this table are illustrated on figures 2-6, 4-55, 4-56, 4-57, 4-58, 4-59, and 4-60.

Date:		Arizona Hazardous Air Pollutants Ambient Air Concentrations (Acute)[1]	Arizona Hazardous Air Pollutants Ambient Air Concentrations (Chronic)[1]	Arizona Ambient Air Quality Standards[2]	EPA Region IX Preliminary Remediation Goal[3]	EPA National Ambient Air Quality Standards[4]	California Acute Reference Exposure Levels[5 6]	9/11/07			9/17/07			9/23/2007			9/29/2007			10/5/2007			10/17/2007		
Avg Wind Speed (mph):								9.44			6.28			5.59			4.23			6.52			4.23		
Avg Wind Direction (degrees):								71			233			310			280			237			279		
Avg Ambient Temperature (ºC):								32.8			28.1			25.3			26.5			27.3			19.5		
Avg Ambient Relative Humidity (%):								6.9			13.5			14.2			7.4			10.5			8.2		
Precipitation (inches)[13]:								NPR			9/14 - 0.42			NPR			9/24 - 2.52			NPR			NA		
Parameter	**Units**							**Result**	**Percent[12]**	**Qual**	**Result**	**Percent[12]**	**Qual**	**Result**	**Percent[12]**	**Qual**	**Result**	**Percent[12]**	**Qual**	**Result**	**Percent[12]**	**Qual**	**Result**	**Percent[12]**	**Qual**
PM_{10}	µg/m³	--	--	150 [7]/50 [8]	--	150 [7]	--	6.68	NA		35.27	NA		16.16	NA		24.66	NA		17.34	NA		44.04	NA	
Aluminum	µg/m³	--	--	--	5.1	--	--	0.0761	1.2590		1.5760	4.8800		0.3675	2.4640		0.7670	3.3840		0.5881	3.7040		1.9130	4.6240	
Antimony	µg/m³	13,000	1.46	--	--	--	--	0.0024	0.0117	*	0.0024	0.0000	*	0.0032	0.0215		0.003	0.0123	*	0.003	0.0113	*	0.003	0.0061	*
Arsenic	µg/m³	2,500	0.000441	--	0.00045	--	0.19	***0.0018***	0.0000	*	***0.0018***	0.0000	*	**0.0045**	0.0303		**0.0103**	0.0455		***0.0015***	0.0074	*	**0.0089**	0.0215	
Barium	µg/m³	--	--	--	0.52	--	--	0.0051	0.0000	*	0.0108	0.0335		0.0051	0.0000	*	0.0087	0.0370	*	0.0063	0.0305	*	0.0242	0.0585	
Bismuth	µg/m³	--	--	--	--	--	--	NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA	
Bromine	µg/m³	--	--	--	--	--	--	0.0011	0.0179		0.0020	0.0063		0.0017	0.0117		0.0010	0.0046		0.0008	0.0047		0.0019	0.0047	
Cadmium	µg/m³	250	0.00105	--	0.0011	--	--	***0.0018***	0.0055	*	***0.0018***	0.0000	*	***0.0021***	0.0000	*	***0.0024***	0.0079	*	***0.0021***	0.0000	*	***0.0021***	0.0006	*
Calcium	µg/m³	--	--	--	--	--	--	0.1189	1.9680		0.7128	2.2080		0.2989	2.0040		0.6290	2.7750		0.3947	2.4870		1.4180	3.4260	
Chlorine	µg/m³	--	--	--	--	--	--	0.0063	0.0000	*	0.1689	0.5232		0.2996	2.0090		0.2430	1.0720		0.1595	1.0050		0.0249	0.0602	
Chromium	µg/m³	100	0.000158	--	0.00016	--	--	***0.0012***	0.0000	*	***0.0015***	0.0006	*	***0.0009***	0.0032	*	**0.0015**	0.0066		***0.0009***	0.0012	*	**0.0019**	0.0046	
Cobalt	µg/m³	10,000	0.000686	--	0.00069	--	--	***0.0024***	0.0234	*	***0.0036***	0.0000	*	***0.0078***	0.0000	*	***0.0156***	0.0000	*	***0.009***	0.0000	*	***0.0237***	0.0000	*
Copper	µg/m³	--	--	--	--	--	100	0.0191	0.3164		0.0555	0.1719		0.2248	1.5070		0.4378	1.9320		0.0591	0.3722		0.4204	1.0160	
Gallium	µg/m³	--	--	--	--	--	--	0.0012	0.0047	*	0.0015	0.0000	*	0.0012	0.0000	*	0.0015	0.0000	*	0.0012	0.0000	*	0.0015	0.0000	*
Germanium	µg/m³	--	--	--	--	--	--	0.0012	0.0164	*	0.0012	0.0013	*	0.0009	0.0000	*	0.0009	0.0000	*	0.0009	0.0000	*	0.0012	0.0000	*
Indium	µg/m³	--	--	--	--	--	--	0.0021	0.0031	*	0.0021	0.0000	*	0.0024	0.0000	*	0.0024	0.0000	*	0.0024	0.0000	*	0.0024	0.0024	*
Iron	µg/m³	--	--	--	--	--	--	0.1033	1.7100		1.0760	3.3320		0.3843	2.5760		0.7585	3.3460		0.4147	2.6120		1.2830	3.1000	
Lanthanum	µg/m³	--	--	--	--	--	--	0.0051	0.0000	*	0.0084	0.0000	*	0.0057	0.0044	*	0.0093	0.0000	*	0.0072	0.0000	*	0.0243	0.0000	*
Lead	µg/m³	--	--	1.5 [9,0,11]	--	1.5 [9,0,11]	--	0.0024	0.0000	*	0.003	0.0061	*	0.0146	0.0978		0.0438	0.1932		0.0040	0.0255		0.0255	0.0617	
Magnesium	µg/m³	--	--	--	--	--	--	0.0138	0.1099	*	0.0834	0.2155	*	0.0856	0.5735		0.0726	0.3205		0.0752	0.4739		0.3412	0.8246	
Manganese	µg/m³	2,500	0.0521	--	0.051	--	--	0.0022	0.0366		0.0307	0.0952		0.0041	0.0278		0.0120	0.0528		0.0076	0.0480		0.0270	0.0653	
Mercury	µg/m³	1,000	0.313	--	0.31	--	1.8	0.0024	0.0000	*	0.0027	0.0000	*	0.0018	0.0000	*	0.0021	0.0000	*	0.0018	0.0000	*	0.0024	0.0000	*
Molybdenum	µg/m³	--	--	--	--	--	--	0.0012	0.0000	*	0.0012	0.0015	*	0.0021	0.0095	*	0.0050	0.0222		0.0021	0.0000	*	0.0046	0.0110	
Nickel	µg/m³	5,000	0.0079	--	0.008	--	6	0.0021	0.0000	*	0.0021	0.0003	*	0.0015	0.0000	*	0.0018	0.0075	*	0.0018	0.0059	*	0.0024	0.0027	*
Palladium	µg/m³	--	--	--	--	--	--	0.0015	0.0062	*	0.0018	0.0000	*	0.0021	0.0000	*	0.0021	0.0000	*	0.0021	0.0000	*	0.0018	0.0000	*
Phosphorus	µg/m³	--	--	--	--	--	--	0.0039	0.0000	*	0.0057	0.0000	*	0.0039	0.0000	*	0.0048	0.0000	*	0.0039	0.0000	*	0.0069	0.0000	*
Potassium	µg/m³	--	--	--	--	--	--	0.0565	0.9360		0.6738	2.0860		0.2108	1.4130		0.3912	1.7260		0.2947	1.8570		0.6997	1.6910	
Rubidium	µg/m³	--	--	--	--	--	--	0.0009	0.0070	*	0.0034	0.0105		0.0009	0.0000	*	0.0009	0.0035	*	0.0012	0.0074		0.0036	0.0088	
Selenium	µg/m³	500	18.3	--	--	--	--	0.0009	0.0000	*	0.0009	0.0000	*	0.0009	0.0060		0.0017	0.0075		0.0009	0.0000	*	0.0051	0.0124	
Silicon	µg/m³	--	--	--	--	--	--	0.3002	4.9680		3.6360	11.2600		1.0040	6.7300		2.0000	8.8240		1.4740	9.2860		4.5840	11.0800	
Silver	µg/m³	--	--	--	--	--	--	0.0018	0.0179	*	0.0018	0.0023	*	0.0021	0.0032	*	0.0021	0.0037	*	0.0021	0.0000	*	0.0021	0.0038	*
Sodium	µg/m³	--	--	--	--	--	--	0.0255	0.0000	*	0.063	0.0000	*	0.5099	3.4180		0.5024	2.2160		0.2716	1.7110		0.2079	0.5024	
Strontium	µg/m³	--	--	--	--	--	--	0.0009	0.0086	*	0.0069	0.0213		0.0021	0.0142		0.0056	0.0247		0.0029	0.0181		0.0115	0.0278	
Sulfur	µg/m³	--	--	--	--	--	--	0.2465	4.0800		0.3668	1.1360		0.4219	2.8280		0.5335	2.3530		0.3277	2.0650		0.4506	1.0890	
Tin	µg/m³	--	--	--	--	--	--	0.0048	0.0000	*	0.0048	0.0000	*	0.0024	0.0000	*	0.0027	0.0000	*	0.0027	0.0000	*	0.003	0.0000	*
Titanium	µg/m³	--	--	--	31	--	--	0.0118	0.1948		0.1022	0.3165		0.0280	0.1878		0.0612	0.2700		0.0414	0.2607		0.1166	0.2819	
Vanadium	µg/m³	--	--	--	--	--	--	0.0015	0.0000	*	0.0038	0.0118		0.0015	0.0000	*	0.0027	0.0058	*	0.0021	0.0036	*	0.0048	0.0000	*
Yttrium	µg/m³	--	--	--	--	--	--	0.0006	0.0055	*	0.0009	0.0028		0.0012	0.0000	*	0.0012	0.0000	*	0.0012	0.0015	*	0.0018	0.0000	*
Zinc	µg/m³	--	--	--	--	--	--	0.0040	0.0670		0.0054	0.0166		0.0118	0.0792		0.0248	0.1093		0.0038	0.0237		0.0282	0.0682	
Zirconium	µg/m³	--	--	--	--	--	--	0.0009	0.0109	*	0.0029	0.0090		0.0015	0.0032	*	0.0018	0.0081		0.0019	0.0119		0.0035	0.0084	

Table Notes:

[1] Arizona Department of Environmental Quality Acute and Chronic Ambient Air Concentrations, Title 18 Chapter 2 Article 17, December 2007
[2] Arizona Department of Environmental Quality Ambient Air Quality Standards, Title 18 Chapter 2 Article 2, December 2007
[3] EPA Region IX Preliminary Remediation Goals, Ambient Air, October 2004
[4] EPA National Ambient Air Quality Standards, http://www.epa.gov/air/criteria.html, February 2008
[5] California Acute Reference Exposure Levels, March 1999
[6] With the exception of arsenic, the averaging time for all listed analytes is one hour. The averaging time for arsenic is four hours.
[7] The averaging time for the criteria is 24 hours.
[8] The averaging time for the criteria is the annual arithmetic mean.
[9] The averaging time for the criteria is the quarterly average.
[10] Only the PM10 fraction is being measured not the total suspended particulates.
[11] On May 20, 2008, EPA proposed to revise the National Ambient Air Quality (NAAQS) for lead to within the range of 0.1-0.3 mg/m³.
[12] Percent of Total Mass
[13] Precipitation measurements are recorded manually by a Hayden-Winkelman High School employee; reliability cannot be verified.
[14] Bold values with bold outline indicate the result exceeds one or more of the comparison criteria.
[15] Bold italicized values indicate the non-detected result exceeds one or more of the comparison criteria.
[16] * = The result is less than three times the level of uncertainty which is shown in place of the result.
[17] -- = Not established
[18] ºC = Degrees Celsius
[19] % = Percent
[20] J = Estimated value
[21] mph = miles per hour
[22] NA = Not Applicable or Not Analyzed
[23] NPR = No precipitation recorded.
[24] µg/m³ = Micrograms per cubic meter
[25] PM_{10} = particulate matter with a diameter less than or equal to 10 microns in size
[26] R = Rejected
[27] This table should be considered preliminary and will be revised based on incoming data, final data validation and QA/QC.

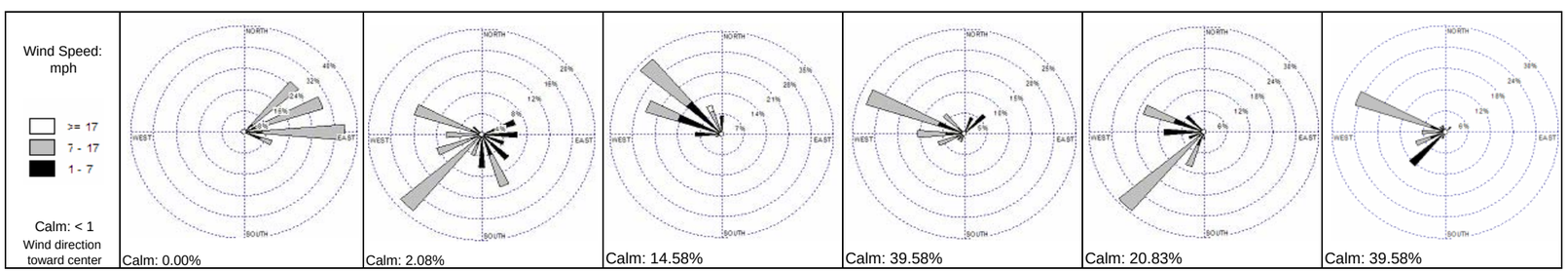

TABLE 4-32

PM_{10} Air Filter Sampling Laboratory Values for Inorganic Parameters

Winkelman Monitoring Station

Remedial Investigation Report

ASARCO LLC Hayden, Arizona Plant Site

The data in this table are illustrated on figures 2-6, 4-55, 4-56, 4-57, 4-58, 4-59, and 4-60.

Date:		Arizona Hazardous Air Pollutants Ambient Air Concentrations (Acute)[1]	Arizona Hazardous Air Pollutants Ambient Air Concentrations (Chronic)[1]	Arizona Ambient Air Quality Standards[2]	EPA Region IX Preliminary Remediation Goal[3]	EPA National Ambient Air Quality Standards[4]	California Acute Reference Exposure Levels[5 6]	10/27/2007			11/1/2007			3/28/08			3/31/08		
Avg Wind Speed (mph):								2.98			2.55			3.85			3.85		
Avg Wind Direction (degrees):								53			307			326			306		
Avg Ambient Temperature (ºC):								22.5			20.7			20.9			17.2		
Avg Ambient Relative Humidity (%):								6.6			7			6.8			7.1		
Precipitation (inches)[13]:								NA			NA			NA			NA		
Parameter	Units							Result	Percent[12]	Qual	Result	Percent[12]	Qual	Result	Percent[12]	Qual	Result	Percent[12]	Qual
PM_{10}	µg/m³	--	--	150 [7]/50 [8]	--	150 [7]	--	14.24	NA		30.86	NA		2.19	NA		12.47	NA	
Aluminum	µg/m³	--	--	--	5.1	--	--	0.5772	4.3160		0.7161	2.4660		0.0066	0.0000	*	0.3324	2.7990	
Antimony	µg/m³	13,000	1.46	--	--	--	--	0.0027	0.0000	*	0.003	0.0057	*	0.0027	0.0161	*	0.0027	0.0000	*
Arsenic	µg/m³	2,500	0.000441	--	0.00045	--	0.19	**0.0057**	0.0429		**0.0042**	0.0144		0.0009	0.0000	*	***0.0021***	0.0107	*
Barium	µg/m³	--	--	--	0.52	--	--	0.0066	0.0246	*	0.0084	0.0289		0.0036	0.0530	*	0.0054	0.0012	*
Bismuth	µg/m³	--	--	--	--	--	--	NA	NA		NA	NA		NA	NA		NA	NA	
Bromine	µg/m³	--	--	--	--	--	--	0.0015	0.0113		0.0028	0.0096		0.0010	0.0484		0.0034	0.0289	
Cadmium	µg/m³	250	0.00105	--	0.0011	--	--	***0.0021***	0.0000	*	***0.0024***	0.0016	*	0.0018	0.0000	*	0.0021	0.0000	*
Calcium	µg/m³	--	--	--	--	--	--	0.4595	3.4350		0.6766	2.3300		0.0024	0.1176		0.2968	2.4990	
Chlorine	µg/m³	--	--	--	--	--	--	0.0057	0.0320	*	0.0063	0.0000	*	0.0039	0.0000	*	0.1107	0.9322	
Chromium	µg/m³	100	0.000158	--	0.00016	--	--	***0.0009***	0.0018	*	***0.0012***	0.0028	*	0.0009	0.0000	*	0.0009	0.0028	*
Cobalt	µg/m³	10,000	0.000686	--	0.00069	--	--	***0.0096***	0.0000	*	***0.0108***	0.0000	*	0.0027	0.0000	*	0.0051	0.0000	*
Copper	µg/m³	--	--	--	--	--	100	0.2624	1.9620		0.1680	0.5785		0.0402	1.1390	*	0.0538	0.4532	
Gallium	µg/m³	--	--	--	--	--	--	0.0012	0.0000	*	0.0012	0.0000	*	0.0012	0.0000	*	0.0012	0.0016	*
Germanium	µg/m³	--	--	--	--	--	--	0.0012	0.0000	*	0.0009	0.0000	*	0.0012	0.0138	*	0.0012	0.0032	*
Indium	µg/m³	--	--	--	--	--	--	0.0021	0.0046	*	0.0024	0.0000	*	0.0021	0.0023	*	0.0021	0.0000	*
Iron	µg/m³	--	--	--	--	--	--	0.5292	3.9570		0.5603	1.9290		0.0048	0.2352		0.2250	1.8950	
Lanthanum	µg/m³	--	--	--	--	--	--	0.0108	0.0000	*	0.0078	0.0000	*	0.0030	0.0484	*	0.0090	0.0020	*
Lead	µg/m³	--	--	1.5 [9,0,11]	--	1.5 [9,0,11]	--	0.0186	0.1394		0.0196	0.0674		0.0024	0.0138	*	0.0044	0.0373	
Magnesium	µg/m³	--	--	--	--	--	--	0.0587	0.4386		0.0822	0.2829		0.0123	0.0000	*	0.0873	0.7351	
Manganese	µg/m³	2,500	0.0521	--	0.051	--	--	0.0073	0.0549		0.0086	0.0295		0.0012	0.0000	*	0.0032	0.0266	
Mercury	µg/m³	1,000	0.313	--	0.31	--	1.8	0.0024	0.0000	*	0.0018	0.0000	*	0.0024	0.0092	*	0.0027	0.0059	*
Molybdenum	µg/m³	--	--	--	--	--	--	0.0065	0.0489		0.0018	0.0008	*	0.0030	0.0669	*	0.0033	0.0000	*
Nickel	µg/m³	5,000	0.0079	--	0.008	--	6	0.0024	0.0011	*	0.0015	0.0023	*	0.0021	0.0000	*	0.0024	0.0000	*
Palladium	µg/m³	--	--	--	--	--	--	0.0018	0.0000	*	0.0021	0.0000	*	0.0018	0.0115	*	0.0018	0.0000	*
Phosphorus	µg/m³	--	--	--	--	--	--	0.0042	0.0000	*	0.0048	0.0000	*	0.0024	0.0000	*	0.0039	0.0000	*
Potassium	µg/m³	--	--	--	--	--	--	0.2268	1.6960		0.2977	1.0250		0.0021	0.0092	*	0.1072	0.9024	
Rubidium	µg/m³	--	--	--	--	--	--	0.0012	0.0042	*	0.0009	0.0031		0.0012	0.0000	*	0.0012	0.0000	*
Selenium	µg/m³	500	18.3	--	--	--	--	0.0009	0.0046	*	0.0022	0.0076		0.0009	0.0300	*	0.0009	0.0067	*
Silicon	µg/m³	--	--	--	--	--	--	1.3830	10.3400		1.8690	6.4360		0.0048	0.0000	*	0.8367	7.0460	
Silver	µg/m³	--	--	--	--	--	--	0.0018	0.0060	*	0.0021	0.0000	*	0.0018	0.0115	*	0.0018	0.0056	*
Sodium	µg/m³	--	--	--	--	--	--	0.1143	0.4101	*	0.2047	0.7049		0.0315	0.2998	*	0.1236	0.8445	*
Strontium	µg/m³	--	--	--	--	--	--	0.0035	0.0264		0.0029	0.0099		0.0015	0.0000	*	0.0024	0.0206	
Sulfur	µg/m³	--	--	--	--	--	--	0.2711	2.0270		0.6182	2.1290		0.0018	0.0438	*	0.3204	2.6980	
Tin	µg/m³	--	--	--	--	--	--	0.003	0.0046	*	0.0027	0.0016	*	0.0030	0.0507	*	0.0030	0.0059	*
Titanium	µg/m³	--	--	--	31	--	--	0.0379	0.2830		0.0552	0.1902		0.0009	0.0346	*	0.0214	0.1800	
Vanadium	µg/m³	--	--	--	--	--	--	0.0018	0.0000	*	0.0024	0.0000	*	0.0006	0.0208	*	0.0012	0.0028	*
Yttrium	µg/m³	--	--	--	--	--	--	0.0018	0.0000	*	0.0009	0.0000	*	0.0018	0.0300	*	0.0018	0.0048	*
Zinc	µg/m³	--	--	--	--	--	--	0.0157	0.1172		0.0176	0.0606		0.0018	0.0115	*	0.0049	0.0412	
Zirconium	µg/m³	--	--	--	--	--	--	0.0021	0.0046	*	0.0012	0.0032	*	0.0021	0.0115	*	0.0024	0.0004	*

Table Notes:

[1] Arizona Department of Environmental Quality Acute and Chronic Ambient Air Concentrations, Title 18 Chapter 2 Article 17, December 2007
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[3] EPA Region IX Preliminary Remediation Goals, Ambient Air, October 2004
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[13] Precipitation measurements are recorded manually by a Hayden-Winkelman High School employee; reliability cannot be verified.
[14] Bold values with bold outline indicate the result exceeds one or more of the comparison criteria.
[15] Bold italicized values indicate the non-detected result exceeds one or more of the comparison criteria.
[16] * = The result is less than three times the level of uncertainty which is shown in place of the result.
[17] -- = Not established
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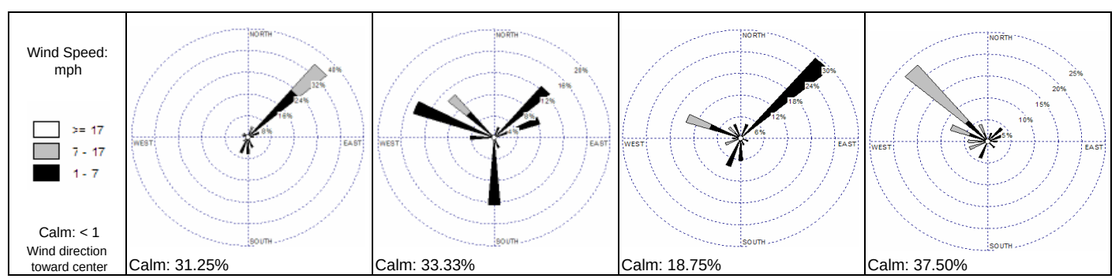

TABLE 4-33
Summary of PM_{10} Air Filter Sampling Laboratory Data
Hayden and Winkelman Monitoring Stations
Remedial Investigation Report
ASARCO LLC Hayden, Arizona Plant Site

Monitoring Station	Analyte	Arizona Ambient Air Quality Standards[1] (µg/m^3)	EPA Region IX Preliminary Remediation Goal[2] (µg/m^3)	Number of Analyses	Number of Detections	Frequency of Detection	Percentage of Detections (%)	Number of EPA Region IX Preliminary Remediation Goal[2] Exceedances	Minimum Detected Value (µg/m^3)	Maximum Detected Value (µg/m^3)	Arithmetic Mean Value (µg/m^3)
Hayden	PM_{10}	150 [3]/50 [4]	--	58	58	58/58	100	0	0.46	**91.5**	37.7
Hayden	Aluminum	--	5.1	57	55	55/57	96	0	0.132	4.16	1.19
Hayden	Antimony	--	--	57	4	4/57	7	0	0.0032	0.012	0.00455
Hayden	Arsenic	--	0.00045	57	49	49/57	86	49	**0.0034**	**0.189**	**0.0239**
Hayden	Barium	--	0.52	57	23	23/57	40	0	0.01	0.0599	0.0137
Hayden	Bismuth	--	--	10	10	10/10	100	0	0.0034	0.262	0.0732
Hayden	Bromine	--	--	57	34	34/57	60	0	0.0012	0.0076	0.00211
Hayden	Cadmium	--	0.0011	57	5	5/57	9	5	**0.0108**	**0.0351**	**0.00453**
Hayden	Calcium	--	--	57	55	55/57	96	0	0.0093	3.23	0.961
Hayden	Chlorine	--	--	57	34	34/57	60	0	0.0084	0.874	0.0845
Hayden	Chromium	--	0.00016	57	27	27/57	47	27	**0.0013**	**0.0072**	**0.00175**
Hayden	Cobalt	--	0.00069	57	0	0/57	0	0	ND	ND	ND
Hayden	Copper	--	--	57	56	56/57	98	0	0.0047	4	0.724
Hayden	Gallium	--	--	57	0	0/57	0	0	ND	ND	ND
Hayden	Germanium	--	--	57	0	0/57	0	0	ND	ND	ND
Hayden	Indium	--	--	57	0	0/57	0	0	ND	ND	ND
Hayden	Iron	--	--	57	56	56/57	98	0	0.0126	3.75	1.23
Hayden	Lanthanum	--	--	57	0	0/57	0	0	ND	ND	ND
Hayden	Lead	1.5 [5,6,7]	--	57	55	55/57	96	0	0.0033	0.836	0.0853
Hayden	Magnesium	--	--	57	48	48/57	84	0	0.0371	0.742	0.188
Hayden	Manganese	--	0.051	54	52	52/54	96	0	0.0015	0.0487	0.0172
Hayden	Mercury	--	0.31	57	0	0/57	0	0	ND	ND	ND
Hayden	Molybdenum	--	--	57	45	45/57	79	0	0.0028	0.0804	0.0136
Hayden	Nickel	--	0.008	57	1	1/57	2	0	0.0019	0.0019	0.00121

TABLE 4-33
Summary of PM_{10} Air Filter Sampling Laboratory Data
Hayden and Winkelman Monitoring Stations
Remedial Investigation Report
ASARCO LLC Hayden, Arizona Plant Site

Monitoring Station	Analyte	Arizona Ambient Air Quality Standards[1] (µg/m^3)	EPA Region IX Preliminary Remediation Goal[2] (µg/m^3)	Number of Analyses	Number of Detections	Frequency of Detection	Percentage of Detections (%)	Number of EPA Region IX Preliminary Remediation Goal[2] Exceedances	Minimum Detected Value (µg/m^3)	Maximum Detected Value (µg/m^3)	Arithmetic Mean Value (µg/m^3)
Hayden	Palladium	--	--	57	0	0/57	0	0	ND	ND	ND
Hayden	Phosphorus	--	--	57	0	0/57	0	0	ND	ND	ND
Hayden	Potassium	--	--	57	56	56/57	98	0	0.0036	1.76	0.54
Hayden	Rubidium	--	--	57	34	34/57	60	0	0.0011	0.0095	0.00229
Hayden	Selenium	--	--	57	38	38/57	67	0	0.0014	0.122	0.0107
Hayden	Silicon	--	--	57	56	56/57	98	0	0.0235	9.26	2.93
Hayden	Silver	--	--	57	2	2/57	4	0	0.0147	0.0175	0.00333
Hayden	Sodium	--	--	57	13	13/57	23	0	0.123	0.532	0.141
Hayden	Strontium	--	--	57	50	50/57	88	0	0.0019	0.0157	0.00531
Hayden	Sulfur	--	--	57	55	55/57	96	0	0.147	2.62	0.841
Hayden	Tin	--	--	57	5	5/57	9	0	0.0079	0.0123	0.00443
Hayden	Titanium	--	31	57	56	56/57	98	0	0.0014	0.346	0.0968
Hayden	Vanadium	--	--	57	3	3/57	5	0	0.001	0.0149	0.00241
Hayden	Yttrium	--	--	57	5	5/57	9	0	0.0009	0.0028	0.00103
Hayden	Zinc	--	--	57	53	53/57	93	0	0.0017	0.655	0.0721
Hayden	Zirconium	--	--	57	37	37/57	65	0	0.0018	0.0103	0.0028
Winkelman	PM_{10}	150 [3]/50 [4]	--	55	55	55/55	100	0	1.53	82.4	20.2
Winkelman	Aluminum	--	5.1	55	54	54/55	98	0	0.0505	4.09	0.637
Winkelman	Antimony	--	--	55	3	3/55	5	0	0.0027	0.0032	0.00155
Winkelman	Arsenic	--	0.00045	55	39	39/55	71	39	**0.0023**	**0.0282**	**0.00796**
Winkelman	Barium	--	0.52	55	23	23/55	42	0	0.008	0.0452	0.00795
Winkelman	Bismuth	--	--	7	7	7/7	100	0	0.0026	0.0131	0.00654
Winkelman	Bromine	--	--	55	44	44/55	80	0	0.0006	0.0083	0.00222
Winkelman	Cadmium	--	0.0011	55	6	6/55	11	6	**0.0022**	**0.0029**	**0.00121**

TABLE 4-33
Summary of PM_{10} Air Filter Sampling Laboratory Data
Hayden and Winkelman Monitoring Stations
Remedial Investigation Report
ASARCO LLC Hayden, Arizona Plant Site

Monitoring Station	Analyte	Arizona Ambient Air Quality Standards[1] (µg/m^3)	EPA Region IX Preliminary Remediation Goal[2] (µg/m^3)	Number of Analyses	Number of Detections	Frequency of Detection	Percentage of Detections (%)	Number of EPA Region IX Preliminary Remediation Goal[2] Exceedances	Minimum Detected Value (µg/m^3)	Maximum Detected Value (µg/m^3)	Arithmetic Mean Value (µg/m^3)
Winkelman	Calcium	--	--	55	54	54/55	98	0	0.0724	3.12	0.549
Winkelman	Chlorine	--	--	55	26	26/55	47	0	0.0132	0.783	0.0793
Winkelman	Chromium	--	0.00016	55	13	13/55	24	13	**0.0013**	**0.0056**	**0.000945**
Winkelman	Cobalt	--	0.00069	55	0	0/55	0	0	ND	ND	ND
Winkelman	Copper	--	--	54	54	54/54	100	0	0.0024	1.3	0.288
Winkelman	Gallium	--	--	55	0	0/55	0	0	ND	ND	ND
Winkelman	Germanium	--	--	55	0	0/55	0	0	ND	ND	ND
Winkelman	Indium	--	--	55	0	0/55	0	0	ND	ND	ND
Winkelman	Iron	--	--	55	55	55/55	100	0	0.0024	3.23	0.573
Winkelman	Lanthanum	--	--	55	0	0/55	0	0	ND	ND	ND
Winkelman	Lead	1.5 [5,6,7]	--	55	46	46/55	84	0	0.003	0.083	0.0224
Winkelman	Magnesium	--	--	55	35	35/55	64	0	0.0468	0.542	0.097
Winkelman	Manganese	--	0.051	55	49	49/55	89	1	0.0016	**0.0544**	0.00908
Winkelman	Mercury	--	0.31	55	0	0/55	0	0	ND	ND	ND
Winkelman	Molybdenum	--	--	55	18	18/55	33	0	0.0033	0.0197	0.00324
Winkelman	Nickel	--	0.008	55	0	0/55	0	0	ND	ND	ND
Winkelman	Palladium	--	--	55	0	0/55	0	0	ND	ND	ND
Winkelman	Phosphorus	--	--	55	0	0/55	0	0	ND	ND	ND
Winkelman	Potassium	--	--	55	55	55/55	100	0	0.0024	1.82	0.279
Winkelman	Rubidium	--	--	55	15	15/55	27	0	0.0007	0.0084	0.00104
Winkelman	Selenium	--	--	55	30	30/55	55	0	0.0009	0.0079	0.00209
Winkelman	Silicon	--	--	55	54	54/55	98	0	0.168	10.4	1.6
Winkelman	Silver	--	--	55	4	4/55	7	0	0.0019	0.0026	0.0011
Winkelman	Sodium	--	--	55	18	18/55	33	0	0.181	0.655	0.136

TABLE 4-33
Summary of PM_{10} Air Filter Sampling Laboratory Data
Hayden and Winkelman Monitoring Stations
Remedial Investigation Report
ASARCO LLC Hayden, Arizona Plant Site

Monitoring Station	Analyte	Arizona Ambient Air Quality Standards[1] (µg/m^3)	EPA Region IX Preliminary Remediation Goal[2] (µg/m^3)	Number of Analyses	Number of Detections	Frequency of Detection	Percentage of Detections (%)	Number of EPA Region IX Preliminary Remediation Goal[2] Exceedances	Minimum Detected Value (µg/m^3)	Maximum Detected Value (µg/m^3)	Arithmetic Mean Value (µg/m^3)
Winkelman	Strontium	--	--	55	44	44/55	80	0	0.001	0.0211	0.00373
Winkelman	Sulfur	--	--	55	54	54/55	98	0	0.0924	1.53	0.493
Winkelman	Tin	--	--	55	9	9/55	16	0	0.0032	0.0116	0.00263
Winkelman	Titanium	--	31	55	54	54/55	98	0	0.0045	0.333	0.0461
Winkelman	Vanadium	--	--	55	2	2/55	4	0	0.0028	0.0038	0.00123
Winkelman	Yttrium	--	--	55	2	2/55	4	0	0.0009	0.0027	0.000799
Winkelman	Zinc	--	--	54	51	51/54	94	0	0.0018	0.0901	0.0203
Winkelman	Zirconium	--	--	55	15	15/55	27	0	0.0011	0.0096	0.00149

Table Notes:
[1] Arizona Department of Environmental Quality Ambient Air Quality Standards, Title 18 Chapter 2 Article 2, December 2007
[2] EPA Region IX Preliminary Remediation Goals, Ambient Air, October 2004
[3] The averaging time for the criteria is 24 hours.
[4] The averaging time for the criteria is the annual arithmetic mean.
[5] The averaging time for the criteria is the quarterly average.
[6] Only the PM_{10} fraction is being measured not the total suspended particulates.
[7] On May 20, 2008, EPA proposed to revise the National Ambient Air Quality (NAAQS) for lead to within the range of 0.1-0.3 mg/m^3.
[8] Bold values with bold outline indicate the result exceeds one or more of the comparison criteria.
[9] % = Percent
[10] ND = Non-detect
[11] µg/m^3 = Micrograms per cubic meter

TABLE 4-34
Wind Speed, Wind Direction and Upwind Sources for Elevated Arsenic Concentrations
Hayden and Winkelman Monitoring Stations
Remedial Investigation Report
ASARCO LLC Hayden, Arizona Plant Site

The data in this table are illustrated on figures 2-6, 4-55, 4-56 and 4-60.

Monitoring Station	Date	Arsenic Concentration (ug/m^3)	Wind Speed (mph)	Prevailing Wind Direction	Sources at Upwind Direction
Hayden	11/21/2006	0.104	5.2	Southeast, East, and Northeast	Smelter Facility
	12/3/2006	0.048	13.1	Northeast, East	Smelter Facility
	1/8/2007	0.015	7.5	Northeast, East, Southeast	Smelter Facility
	3/3/2007	0.051	9.0	Northeast	Smelter Facility
	8/30/2007	0.179	7.8	Northeast, East	Smelter Facility
	9/11/2007	0.189	8.8	Northeast	Smelter Facility
	10/22/2007	0.146	9.6	Northeast, East	Smelter Facility
	11/7/2007	0.068	8.9	Northeast, Southeast	Smelter Facility
Winkelman	2/19/2007	0.026	6.5	Northwest	Smelter Facility; Concentrator Crusher, Conveyor, Hopper
	4/26/2007	0.019	3.9	Northwest	Smelter Facility; Concentrator Crusher, Conveyor, Hopper
	5/8/2007	0.028	5.03	Northeast, Southwest	Open space, Smelter Facility
	5/14/2007	0.028	5.4	Northwest	Smelter Facility; Concentrator Crusher, Conveyor, Hopper
	6/1/2007	0.023	4.4	Northwest	Smelter Facility; Concentrator Crusher, Conveyor, Hopper
	6/25/2007	0.023	3.7	Northwest	Smelter Facility; Concentrator Crusher, Conveyor, Hopper
	8/18/2007	0.021	2.7	Southwest, Southeast, Northwest	Open space, Tailings Impoundments, Smelter Facility

Table Notes:
[1] mph = Miles per hour
[2] µg/m^3 = micrograms per cubic meter

TABLE 4-35
Comparison of Ambient Air Concentrations at Organ Pipe, Hayden and Winkelman Monitoring Stations
Remedial Investigation Report
ASARCO LLC Hayden, Arizona Plant Site

Air Contaminant	EPA Region IX Preliminary Remediation Goal[1] (µg/m3)	Average Ambient Air Concentration at Organ Pipe National Monument[2] (µg/m^3)	Average Ambient Air Concentration at Hayden Jail Monitoring Station[3] (µg/m^3)	Average Ambient Air Concentration at Hayden[4] (µg/m^3)	Average Ambient Air Concentration at Hayden during Smelter Shutdown[5] (µg/m^3)	Average Ambient Air Concentration at Winkelman[6] (µg/m^3)	Average Ambient Air Concentration at Winkelman during Smelter Shutdown[5] (µg/m^3)	Ratio of Concentration at Hayden to Organ Pipe National Monument	Ratio of Concentration at Winkelman to Organ Pipe National Monument
PM_{10}	--	16	NA	37.7	19.5	20.2	6.88	2.36	1.26
Arsenic	0.00045	ND (0.0003-0.0006)	**0.0331**	**0.0239**	**0.00431**	**0.00796**	**0.00163**	39.83-79.67 [7]	13.27-26.53 [7]
Cadmium	0.0011	ND (0.0006)	**0.0168**	**0.00453**	***ND (0.0018-0.0051)***	**0.00121**	***ND (0.0018-0.0021)***	7.55 [7]	2.02 [7]
Chromium	0.00016	**0.000493**	**0.00641**	**0.00175**	**0.00281**	**0.000945**	**0.00096**	3.55	1.92
Copper	--	0.00142	0.865	0.724	0.252	0.288	0.148	509.86	202.82
Lead	--	0.00133	0.0686	0.0853	0.0163	0.0224	0.00484	64.14	16.84

Table Notes:

[1] EPA Region IX Preliminary Remediation Goals, Ambient Air, October 2004

[2] The data is based on analysis of 15 PM_{10} filter samples collected at a 24-day interval from January 2, 2006 to December 4, 2006 at Organ Pipe National Monument.

[3] Sandra Wardwell, Data Management Team, Arizona Department of Environmental Quality, "ADEQ XRF Data Hayden PM10 Dichot Filters 1991-2001", E-mail to Prabhat Bhargava, October 13, 2005.

[4] The date range of the Hayden data is between October 22, 2006 and November 7, 2007.

[5] The date ranges of the ASARCO smelter shutdowns are between January 15, 2007 through February 5, 2007 and March 10, 2008 through March 31, 2008.

[6] The date range of the Winkelman data is between November 21, 2006 and November 1, 2007.

[7] Ratios were calculated using the reporting limit when the results were not detected.

[8] Bold values with bold outline indicate the value exceeds the comparison criteria.

[9] Bold italicized values have detection limits above one or more of the comparison criteria.

[10] -- = Not established

[11] NA = Not available

[12] ND = Not detected; reporting limit is shown in place of a result.

[13] PM_{10} = particulate matter with a diameter less than or equal to 10 microns in size

[14] µg/m^3 = micrograms per cubic meter

TABLE 4-36
Dust Sampling Laboratory Values for Inorganic and General Parameters
Remedial Investigation Report
ASARCO LLC Hayden, Arizona Plant Site

The data in this table are illustrated on figures 4-61, 4-62, 4-63, 4-64, 4-65, 4-66, 4-67, 4-68, and 4-69.

	Location:	Arizona	HDA-101-07-029		HDI-101-07-029		HDI-101-07-040		HDA-101-07-046		HDI-101-07-046		HDI-101-07-047		HDI-101-07-052		HDA-101-07-061		HDI-101-07-061		HDI-101-07-089T	
	Date:	Residential Soil	05/18/06		05/18/06		05/18/06		02/23/06		02/23/06		05/17/06		05/18/06		05/18/06		05/18/06		05/17/06	
Parameter	Units	Remediation Level[1]	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual
Aluminum	mg/kg	76,000	8,840		10,400		8,520		8,270		3,370		5,970		14,000		10,700		11,200		10,000	
Antimony	mg/kg	31	6.1		3.6	J	5.2	J	3.8	J	2.8	J	3.5	J	3.6	J	10.2	J	6.7	J	7.3	J
Arsenic	mg/kg	10	**127**		**45.8**		**44.6**		**92.8**		8.5		**43.7**		**31.3**		**259**		**94.0**		**49.7**	
Barium	mg/kg	15,000	136		690		196		216		2,250		298		127	J	964		347		909	
Beryllium	mg/kg	150	0.3	J	0.36	J	0.2	J	0.27	UJ	0.12	UJ	0.16	J	0.13	J	0.27	U	0.19	U	0.17	J
Boron	mg/kg	16,000	5.7		19.6		1,980		20		18.5		32.4	J	41.1	J	10.1	J	59.7	J	29.2	J
Cadmium	mg/kg	39	21		**85.7**		9.2		20.9		15.5		8.2	J	7.3	J	**51.4**		19.4	J	8.7	J
Calcium	mg/kg	--	40,100		38,800		49,300		33,500		24,400		76,300	J	39,100	J	36,900	J	35,500	J	27,800	J
Chromium	mg/kg	--	21.3		18.8		20.2		4.6		38.1		41.4		24.2		23.9		33.6		18.4	
Cobalt	mg/kg	900	40.2		17.9		18.4		24.3		13.3		31.1		13.1		36.8		18.6		18.2	
Copper	mg/kg	3,100	**29,700**		**10,200**		**16,700**		**18,100**		2,200		**6,670**		**10,400**		**34,600**		**14,000**		**15,300**	
Cyanide	mg/kg	1,200	NA		NA		NA		1.6	J	4.6		NA		NA		NA		NA		NA	
Iron	mg/kg	--	54,000		24,300		25,100		28,100		6,910		17,500		19,200		41,700		22,800		39,000	
Lead	mg/kg	400	**598**		295		192		**1,640**	J	**88,600**	J	**816**	J	193	J	**1,100**	J	**475**	J	186	J
Magnesium	mg/kg	--	7,250		7,630		9,410		6,990		2,770		6,040	J	6,010	J	8,320	J	8,410	J	6,200	J
Manganese	mg/kg	3,300	302		321		266		245		122		211	J	238	J	334	J	294	J	286	J
Mercury	mg/kg	23	0.43		0.3		0.26		0.94		0.88		1.1		0.38		1.0		1.5		0.20	
Molybdenum	mg/kg	390	235		93.1		135		106		14.6		53.5		66.2		287		116		133	
Nickel	mg/kg	1,600	48.5		31.7		42.8		32.2		8.1		20.2		32.7		45.5		35.0		42.0	
Potassium	mg/kg	--	2,780		4,550		7,060		3,080	J	1,820	J	3,190		3,120		3,630		3,880		3,040	
Selenium	mg/kg	390	17		13.9		13.8		13.3		3	J	11.4	J	7.4	J	30.1	J	18.6	J	13.6	J
Silver	mg/kg	390	15		8.5		10.1		8.3		2.6		6.7		7.0		13.1		9.0		8.3	
Sodium	mg/kg	--	1,450		3,310		4,040		3,010		8,310		8,930		3,910		2,700		5,040		3,670	
Thallium	mg/kg	5.2	0.7	U	0.7	U	0.7	U	0.68	UJ	2	UJ	0.70	UJ	0.70	UJ	0.70	UJ	0.70	UJ	0.70	UJ
Vanadium	mg/kg	78	37.2		38.9		31.3		31		10.6		20.7		28.9		41.3		35.2		28.1	
Zinc	mg/kg	23,000	1,280		1,340		1,150		3,440		6,400		2,980	J	1,000	J	3,780	J	3,330	J	7,760	J
Percent Solids	%	--	NA		NA		NA		98		NA		NA		NA		NA		NA		NA	
pH		--	NA		NA		NA		5.8		NA		NA		NA		NA		NA		NA	
Total Organic Carbon		--	NA		NA		NA		3		NA		NA		NA		NA		NA		NA	

TABLE 4-36
Dust Sampling Laboratory Values for Inorganic and General Parameters
Remedial Investigation Report
ASARCO LLC Hayden, Arizona Plant Site

The data in this table are illustrated on figures 4-61, 4-62, 4-63, 4-64, 4-65, 4-66, 4-67, 4-68, and 4-69.

	Location:	Arizona	HDI-101-07-099		HDA-101-07-111		HDI-101-07-111		HDI-101-07-117		HDI-101-07-149		HDI-101-07-177		HDA-101-09-070		HDI-101-09-070		HDA-101-09-077		HDI-101-09-077	
	Date:	Residential Soil	05/17/06		05/17/06		05/17/06		05/18/06		05/17/06		05/18/06		05/17/06		05/17/06		05/17/06		05/17/06	
Parameter	Units	Remediation Level[1]					Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual
Aluminum	mg/kg	76,000	13,800		7,640		**173,000**		19,100		9,030		8,370		7,870		8,320		9,280		12,300	
Antimony	mg/kg	31	8.2	J	12.7	J	**36.7**	J	3.8	J	1.3	J	1.8	J	2.3	J	3.0	J	3.1	J	4.3	J
Arsenic	mg/kg	10	**119**		**126**		**209**		**39.6**		8.3		**10**		**45.0**		**19.1**		**71.1**		**75.5**	
Barium	mg/kg	15,000	210		138	J	654	J	173		137	J	74.8		223		3,340		227		928	
Beryllium	mg/kg	150	0.19	J	0.26	J	0.76	J	0.20	J	0.21	J	0.2	J	0.27	U	0.22	J	0.31	J	0.39	J
Boron	mg/kg	16,000	33.1	J	43.2	J	880	J	30.0	J	27.2	J	14.9		19.5	J	90.5	J	8.1	J	16.2	J
Cadmium	mg/kg	39	28.6	J	23.8	J	**465**		12.0	J	2.2	J	2.4		5.6	J	23.0		8.8	J	14.8	J
Calcium	mg/kg	--	51,100	J	39,700	J	154,000	J	31,000	J	95,100	J	38,500		23,800	J	45,400	J	28,600	J	21,400	J
Chromium	mg/kg	--	24.9		23.2		117		22.0		17.5		15.5		25.0		29.9		21.2		24.0	
Cobalt	mg/kg	900	31.8		32.3		42.9	J	14.9		8.6	J	8.1		11.6		15.9		14.6		22.2	
Copper	mg/kg	3,100	**29,100**		**32,200**		**28,800**		**8,840**		1,420		1,540		**7,980**		**4,300**		**10,100**		**15,000**	
Cyanide	mg/kg	1,200	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
Iron	mg/kg	--	78,300		39,100		53,200		60,300		19,000		21,100		16,800		15,600		19,800		29,100	
Lead	mg/kg	400	329	J	**499**	J	**827**	J	164	J	107	J	41.7		**521**	J	**54,400**	J	**620**	J	**6,050**	J
Magnesium	mg/kg	--	7,220	J	5,890	J	19,800	J	6,890	J	8,830	J	5,740		5,290	J	5,070	J	6,700	J	9,070	J
Manganese	mg/kg	3,300	448	J	254	J	927	J	364	J	305	J	246		204	J	209	J	275	J	378	J
Mercury	mg/kg	23	0.45		2.9		NA		0.18		1.4		0.3		1.4		1.4		1.8		3.2	
Molybdenum	mg/kg	390	233		248		314		83.6		13.5		22.4		86.4		58.4		119		169	
Nickel	mg/kg	1,600	41.9		43.8		136		44.9		24.3		18.9		26.1		22.1		24.3		34.0	
Potassium	mg/kg	--	3,000		2,630		20,500		3,740		2,530		3,390		2,530		3,550		3,170		5,880	
Selenium	mg/kg	390	23.2	J	31.8	J	98.6	J	10.0	J	1.3	J	3	J	6.0	J	6.6	J	8.5	J	16.7	J
Silver	mg/kg	390	10.3		10.9		22.1		5.7		0.97		1.3		4.2		1.0	U	5.2		10.9	
Sodium	mg/kg	--	5,310		3,930		39,700		7,180		7,640		4,110		1,680		7,360		1,390		2,840	
Thallium	mg/kg	5.2	0.70	UJ	0.70	UJ	4.7	U	0.70	UJ	0.70	UJ	0.7	U	0.70	UJ	1.4	U	0.70	UJ	0.70	UJ
Vanadium	mg/kg	78	31.9		34.9		**84.2**		36.0		29.2		23.5		30.2		23.9		38.4		51.7	
Zinc	mg/kg	23,000	9,530	J	7,450	J	8,670	J	9,710	J	497	J	2,560		634	J	8,930	J	1,220	J	1,580	J
Percent Solids	%	--	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
pH		--	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	
Total Organic Carbon		--	NA		NA		NA		NA		NA		NA		NA		NA		NA		NA	

TABLE 4-36
Dust Sampling Laboratory Values for Inorganic and General Parameters
Remedial Investigation Report
ASARCO LLC Hayden, Arizona Plant Site

The data in this table are illustrated on figures 4-61, 4-62, 4-63, 4-64, 4-65, 4-66, 4-67, 4-68, and 4-69.

	Location:	Arizona	HDA-101-09-104		HDA-101-09-104		HDI-101-09-104		HDA-101-09-106		HDI-101-09-106		HDI-101-09-111B		HDI-101-09-111B		HDA-101-09-137		HDI-101-09-137		WDI-101-12-093	
	Date:	Residential Soil	05/17/06		05/17/06		05/17/06		02/23/06		02/23/06		05/17/06		05/17/06		05/18/06		05/18/06		05/17/06	
Parameter	Units	Remediation Level[1]	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual	Result	Qual
Aluminum	mg/kg	76,000	10,100		9,710		8,580		12,100		10,100		11,000		13,900		12,500		14,500		30,800	
Antimony	mg/kg	31	2.9	J	2.7	J	4.2	J	5.8	J	2.9	J	13.4	J	11.6	J	8.6		3.1	J	**110**	J
Arsenic	mg/kg	10	**78.1**		**75.1**		**43.0**		**147**		**30.6**		**130**		**170**		**207**		**60.4**		**10.2**	
Barium	mg/kg	15,000	192		190		253		251		190		171		217		177		259		459	
Beryllium	mg/kg	150	0.30	J	0.30	J	0.25	J	0.46	UJ	0.22	UJ	0.20	J	0.27	J	0.44	J	0.46	J	0.17	J
Boron	mg/kg	16,000	7.4	J	7.6	J	23.5	J	9.8		31.1		26.9	J	17.6	J	58		58.8		71.2	J
Cadmium	mg/kg	39	8.8	J	8.4	J	9.8	J	18		6.4		31.8	J	**40.0**	J	29.5		8.6		5.0	J
Calcium	mg/kg	--	18,500	J	18,900	J	18,900	J	26,400		32,100		23,900	J	24,900	J	18,900		23,600		22,300	J
Chromium	mg/kg	--	15.7		15.1		21.2		8.3		4.8		24.7		23.1		21.5		22		20.1	
Cobalt	mg/kg	900	16.2		16.1		14.0		24.5		20.5		40.9		35.0		26.7		24.7		5.5	
Copper	mg/kg	3,100	**10,600**		**10,100**		**7,970**		**21,200**		**12,400**		**25,800**		**37,000**		**27,000**		**18,300**		915	
Cyanide	mg/kg	1,200	NA		NA		NA		0.8	J	0.57	J	NA		NA		NA		NA		NA	
Iron	mg/kg	--	20,300		19,600		18,500		29,400		28,700		171,000		88,900		35,600		34,400		16,300	
Lead	mg/kg	400	**546**	J	**480**	J	216	J	**705**		**1,700**		**400**	J	**505**	J	**762**		187		227	J
Magnesium	mg/kg	--	6,800	J	6,690	J	6,970	J	7,920		7,880		6,710	J	8,510	J	8,830		11,700		5,400	J
Manganese	mg/kg	3,300	300	J	337	J	274	J	396		428		702	J	511	J	364		517		235	J
Mercury	mg/kg	23	0.80		0.81		0.23		1.9		0.38		0.91		0.98		1		0.76		0.069	
Molybdenum	mg/kg	390	150		134		127		331		135		225		316		324		257		13.2	
Nickel	mg/kg	1,600	24.5		24.0		25.6		31.2		71.6		82.4		57.3		41.5		37.3		32.6	
Potassium	mg/kg	--	3,520		3,310		5,250		3,670		4,750		3,760		4,720		5,390		6,490		3,040	
Selenium	mg/kg	390	9.2	J	8.5	J	17.3	J	18.1	J	10.6	J	24.3	J	36.2	J	20.2		16.4		2.5	J
Silver	mg/kg	390	6.3		5.7		6.2		15.9		6.6		20.3		30.2		23.4		12.1		0.96	
Sodium	mg/kg	--	1,690		1,840		3,870		1,420		5,730		12,200		9,650		1,470		1,940		6,700	
Thallium	mg/kg	5.2	0.70	UJ	0.70	UJ	0.70	UJ	0.71	U	0.71	U	0.70	UJ	0.70	UJ	0.7	U	0.7	U	0.70	UJ
Vanadium	mg/kg	78	40.4		38.5		35.0		42		44.5		39.6		52.7		55.1		68.2		21.8	
Zinc	mg/kg	23,000	675	J	661	J	1,520	J	1,350		3,080		**28,400**	J	15,000	J	1,530		1,260		7,220	J
Percent Solids	%	--	NA		NA		NA		99		NA		NA		NA		NA		NA		NA	
pH		--	NA		NA		NA		5.6		NA		NA		NA		NA		NA		NA	
Total Organic Carbon		--	NA		NA		NA		2.4		NA		NA		NA		NA		NA		NA	

TABLE 4-36
Dust Sampling Laboratory Values for Inorganic and General Parameters
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The data in this table are illustrated on figures 4-61, 4-62, 4-63, 4-64, 4-65, 4-66, 4-67, 4-68, and 4-69.

	Location:	Arizona	WDI-101-12-136		WDI-101-12-136		WDA-101-12-147A		WDI-101-12-147A		WDA-101-12-241		WDI-101-12-241		Reference Blank	
	Date:	Residential Soil	05/18/06		05/18/06		05/18/06		05/18/06		05/18/06		05/18/06		09/21/06	
Parameter	**Units**	**Remediation Level[1]**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**	**Result**	**Qual**
Aluminum	mg/kg	76,000	4,000		3,870		11,700		7,230		10,300		9,260		560	
Antimony	mg/kg	31	1.1	J	1.4	J	1.4	J	1.8	J	**112**		1.3	J	20	U
Arsenic	mg/kg	10	3.9		3.8		**16.4**		4.9		**54**		5		1.6	J
Barium	mg/kg	15,000	365		137		154		105		134		136		12	
Beryllium	mg/kg	150	0.13	J	0.13	J	0.41	J	0.24	J	0.35	J	0.25	J	0.25	
Boron	mg/kg	16,000	30.8		31.7		9		19.1		10.7		28.2		NA	
Cadmium	mg/kg	39	1.9		2.5		2.6		2.1		13.9		3		1	U
Calcium	mg/kg	--	14,100		13,900		19,100		19,200		26,200		24,400		100	J
Chromium	mg/kg	--	8.6		8.7		15.8		23		13.9		21.6		2	U
Cobalt	mg/kg	900	3	J	3	J	12		6.1		10.3		10.3		4	U
Copper	mg/kg	3,100	476		449		1,910		803		1,620		643		8	U
Cyanide	mg/kg	1,200	NA		NA		NA		NA		NA		NA		NA	
Iron	mg/kg	--	7,290		7,360		19,400		11,600		15,800		23,700		4,100	
Lead	mg/kg	400	43.6		51		95.2		66.9		161		64.5		2.8	J
Magnesium	mg/kg	--	2,890		2,790		7,390		4,700		7,260		7,750		60	J
Manganese	mg/kg	3,300	114		109		353		222		289		292		63	
Mercury	mg/kg	23	0.35		0.19		0.063		0.12		0.36		0.15		0.025	U
Molybdenum	mg/kg	390	5.4		5.6		22.4		9.4		16.1		11.3		10	U
Nickel	mg/kg	1,600	43.5		26.5		21		15.2		17.5		32.5		10	U
Potassium	mg/kg	--	3,260		3,460		4,080		3,790		3,430		3,490		1,000	U
Selenium	mg/kg	390	0.79	J	0.74	J	2.3	J	0.95	J	3.3	J	0.76	J	2	U
Silver	mg/kg	390	2.1		1.5		2.2		0.81	J	0.85	J	0.64	J	2	U
Sodium	mg/kg	--	171,999		170,000		1,220		17,600		1,210		15,100		100	U
Thallium	mg/kg	5.2	0.7	U	0.7	U	0.7	U	0.7	U	0.7	U	0.7	U	***10***	U
Vanadium	mg/kg	78	9.7		9.7		38.7		22.3		33.7		29.8		3.7	J
Zinc	mg/kg	23,000	1,220		1,080		633		317		818		2,690		6.8	J
Percent Solids	%	--	NA		NA		NA		NA		NA		NA		100	
pH		--	NA		NA		NA		NA		NA		NA		NA	
Total Organic Carbon		--	NA		NA		NA		NA		NA		NA		NA	

Table Notes:

[1] Arizona Department of Environmental Quality Residential Soil Remediation Levels, Title 18 Chapter 7, January 2008
[2] Bold values with bold outline exceed one or more of the comparison criteria.
[3] -- = Not established
[4] % = Percent
[5] HDA = Hayden Dust - Attic
[6] HDI = Hayden Dust - Indoor
[7] J = Estimated value
[8] mg/kg = milligrams per kilogram
[9] NA = Not analyzed
[10] U = Not detected; reporting limit is shown in place of a result.
[11] UJ = Not detected; reporting limit is approximate and is shown in place of a result.
[12] WDA = Winkelman Dust - Attic
[13] WDI = Winkelman Dust - Indoor

TABLE 4-37

Comparison of Indoor Dust, Attic Dust, Surface Soil Statistics and Entry Way Soil Sample Arsenic Results
Remedial Investigation Report
ASARCO LLC Hayden, Arizona Plant Site

The data in this table are illustrated on figures 4-61, 4-62, 4-63, and 4-67.

		Attic		Indoor		Surface Soil Statistics	Front Entry Way Soil Sample			Additional Front Entry Way Soil Sample			Additional Side/Back Entry Way Sample		
Parcel	Units	Result	Qual	Result	Qual	95% UCL	SubArea	Result	Qual	SubArea	Result	Qual	SubArea	Result	Qual
Hayden															
101-07-029	mg/kg	127		45.8		51.9	B	46.1	J-	NA	NA		E	40	J-
101-07-040	mg/kg	NA		44.6		54.5	H	22	J-	NA	NA		C	29.8	J-
101-07-046	mg/kg	92.8		8.5		20.3	I	10.6	J-	NA	NA		NA	NA	
101-07-047	mg/kg	NA		43.7		42.3	A	41.1	J-	NA	NA		I	42.1	
101-07-052	mg/kg	NA		31.3		36.6	C	13.8	J-	NA	NA		NA	NA	
101-07-061	mg/kg	259		94		27.6	C	14.4	J-	NA	NA		NA	NA	
101-07-089T	mg/kg	NA		49.7		540	E	32.4		NA	NA		NA	NA	
101-07-099	mg/kg	NA		119		58	G	91.9	J-	NA	NA		NA	NA	
101-07-111	mg/kg	126		209		15.3	C	7.6	J-	NA	NA		NA	NA	
101-07-117	mg/kg	NA		39.6		36	E	16.9	J-	NA	NA		B	41.2	J-
101-07-149	mg/kg	NA		8.3		20.8	D	18.2	J-	B	33.6	J-	NA	NA	
101-07-177	mg/kg	NA		10		NA	NA	NA		NA	NA		NA	NA	
101-09-070	mg/kg	45		19.1		25.9	C	19.1		NA	NA		H	20.1	J-
101-09-077	mg/kg	71.1		75.5		45.7	E	38.4	J-	NA	NA		NA	NA	
101-09-104	mg/kg	78.1		43		42.9	G	23.6	J-	NA	NA		E	53.4	J-
101-09-106	mg/kg	147		30.6		52.4	G	37.3	J-	NA	NA		NA	NA	
101-09-111B	mg/kg	NA		170		60.5	E	34	J-	NA	NA		F	79.9	J-
101-09-137	mg/kg	207		60.4		30.8	NA	NA		NA	NA		NA	NA	
Winkelman															
101-12-093	mg/kg	NA		10.2		7.43	G	7.4	J-	NA	NA		NA	NA	
101-12-136	mg/kg	NA		3.9		4.97	G	4.5	J-	NA	NA		NA	NA	
101-12-147A	mg/kg	16.4		4.9		6.08	B	3.3	J-	NA	NA		NA	NA	
101-12-241	mg/kg	54		5		4.83	C	2.9		I	6.3	J-	NA	NA	

Table Notes:

[1] The maximum concentration between field duplicates and primary samples was used.
[2] J- = Estimated value, may be biased low
[3] mg/kg = milligrams per kilogram
[4] NA = Not analyzed
[5] = 1 to 10 mg/kg
[6] = 10.1 to 25.9 mg/kg
[7] = 26 to 47.9 mg/kg
[8] = Greater than 48 mg/kg

TABLE 4-38

Comparison of Indoor Dust, Attic Dust, Surface Soil Statistics and Entry Way Soil Sample Copper Results

Remedial Investigation Report

ASARCO LLC Hayden, Arizona Plant Site

The data in this table are illustrated on figures 4-61, 4-62, 4-64, and 4-68.

Parcel	Units	Attic		Indoor		Surface Soil Statistics	Front Entry Way Soil Sample			Additional Front Entry Way Soil Sample			Additional Side/Back Entry Way Sample		
		Result	Qual	Result	Qual	95% UCL	SubArea	Result	Qual	SubArea	Result	Qual	SubArea	Result	Qual
Hayden															
101-07-029	mg/kg	29,700		10,200		12,100	B	10,800	J-	NA	NA		E	9,790	J-
101-07-040	mg/kg	NA		16,700		23,400	H	7,400	J-	NA	NA		C	18,100	J-
101-07-046	mg/kg	18,100		2,200		4,330	I	2,790	J-	NA	NA		NA	NA	
101-07-047	mg/kg	NA		6,670		10,500	A	9,540	J-	NA	NA		I	9,960	
101-07-052	mg/kg	NA		10,400		11,400	C	4,220	J-	NA	NA		NA	NA	
101-07-061	mg/kg	34,600		14,000		5,680	C	3,030	J-	NA	NA		NA	NA	
101-07-089T	mg/kg	NA		15,300		19,500	E	15,600		NA	NA		NA	NA	
101-07-099	mg/kg	NA		29,100		14,800	G	16,800		NA	NA		NA	NA	
101-07-111	mg/kg	32,200		28,800		6,400	C	2,350	J-	NA	NA		NA	NA	
101-07-117	mg/kg	NA		8,840		11,300	E	2,580	J-	NA	NA		B	13,800	J-
101-07-149	mg/kg	NA		1,420		5,660	D	3,680	J-	B	10,300	J-	NA	NA	
101-07-177	mg/kg	NA		1,540		NA	NA	NA		NA	NA		NA	NA	
101-09-070	mg/kg	7,980		4,300		8,510	C	3,420		NA	NA		H	3,830	J-
101-09-077	mg/kg	10,100		15,000		6,550	E	7,380	J-	NA	NA		NA	NA	
101-09-104	mg/kg	10,600		7,970		12,700	G	5,630	J-	NA	NA		E	19,700	J-
101-09-106	mg/kg	21,200		12,400		12,000	G	11,600	J-	NA	NA		NA	NA	
101-09-111B	mg/kg	NA		37,000		13,800	E	6,310	J-	NA	NA		F	18,200	J-
101-09-137	mg/kg	27,000		18,300		5,570	NA	NA		NA	NA		NA	NA	
Winkelman															
101-12-093	mg/kg	NA		915		1,040	G	499	J-	NA	NA		NA	NA	
101-12-136	mg/kg	NA		476		396	G	262	J-	NA	NA		NA	NA	
101-12-147A	mg/kg	1,910		803		631	B	416	J-	NA	NA		NA	NA	
101-12-241	mg/kg	1,620		643		374	C	174		I	477	J-	NA	NA	

Table Notes:

[1] The maximum concentration between field duplicates and primary samples was used.

[2] J- = Estimated value, may be biased low

[3] mg/kg = milligrams per kilogram

[4] NA = Not analyzed

[5] = 0 to 3,100 mg/kg

[6] = 3,101 to 8,699 mg/kg

[7] = 8,700 to 17,100 mg/kg

[8] = Greater than 17,100 mg/kg

TABLE 4-39

Comparison of Indoor Dust, Attic Dust, Surface Soil Statistics and Entry Way Soil Sample Lead Results
Remedial Investigation Report
ASARCO LLC Hayden, Arizona Plant Site

The data in this table are illustrated on figures 4-61, 4-62, 4-65, 4-66, and 4-69.

		Attic		Indoor		Surface Soil Statistics	Front Entry Way Soil Sample			Additional Front Entry Way Soil Sample			Additional Side/Back Entry Way Sample		
Parcel	Units	Result	Qual	Result	Qual	95% UCL	SubArea	Result	Qual	SubArea	Result	Qual	SubArea	Result	Qual
Hayden															
101-07-029	mg/kg	598		295		483	B	249	J-	NA	NA		E	691	J-
101-07-040	mg/kg	NA		192		217	H	58.9	J-	NA	NA		C	83.8	J-
101-07-046	mg/kg	1,640	J	88,600	J	734	I	978	J-	NA	NA		NA	NA	
101-07-047	mg/kg	NA		816	J	755	A	351	J-	NA	NA		I	908	J
101-07-052	mg/kg	NA		193	J	237	C	78.6	J-	NA	NA		NA	NA	
101-07-061	mg/kg	1,100	J	475	J	210	C	67.1	J-	NA	NA		NA	NA	
101-07-089T	mg/kg	NA		186	J	265	E	109	J	NA	NA		NA	NA	
101-07-099	mg/kg	NA		329	J	406	G	303		NA	NA		NA	NA	
101-07-111	mg/kg	499	J	827	J	100	C	19.2	J-	NA	NA		NA	NA	
101-07-117	mg/kg	NA		164	J	312	E	53.4	J-	NA	NA		B	389	J-
101-07-149	mg/kg	NA		107	J	252	D	289	J-	B	424	J-	NA	NA	
101-07-177	mg/kg	NA		41.7		NA	NA	NA		NA	NA		NA	NA	
101-09-070	mg/kg	521	J	54,400	J	3,030	C	312		NA	NA		H	306	J-
101-09-077	mg/kg	620	J	6,050	J	7,250	E	533	J-	NA	NA		NA	NA	
101-09-104	mg/kg	546	J	216	J	471	G	143	J-	NA	NA		E	639	J-
101-09-106	mg/kg	705		1,700		1,350	G	290	J-	NA	NA		NA	NA	
101-09-111B	mg/kg	NA		505	J	385	E	198	J-	NA	NA		F	337	J-
101-09-137	mg/kg	762		187		105	NA	NA		NA	NA		NA	NA	
Winkelman															
101-12-093	mg/kg	NA		227	J	101	G	51.1	J-	NA	NA		NA	NA	
101-12-136	mg/kg	NA		51		65	G	42.7	J-	NA	NA		NA	NA	
101-12-147A	mg/kg	95.2		66.9		133	B	45.4	J-	NA	NA		NA	NA	
101-12-241	mg/kg	161		64.5		60.3	C	19.2		I	126	J-	NA	NA	

Table Notes:

[1] The maximum concentration between field duplicates and primary samples was used.
[2] J = Estimated value
[3] J- = Estimated value, may be biased low
[4] mg/kg = milligrams per kilogram
[5] NA = Not analyzed
[6] = 0 to 212 mg/kg
[7] = 213 to 400 mg/kg
[8] = 401 to 1,199 mg/kg
[9] = 1,200 to 2,400 mg/kg
[10] = Greater than 2,400 mg/kg

TABLE 4-40
Summary of Habitat and Wildlife Observations[1]
Remedial Investigation Report
ASARCO LLC Hayden, Arizona Plant Site

Survey Location	Habitat Observations	Wildlife Observations
EUP01 – terrestrial	Sparse vegetation with 30% of location mixed wooded (paloverde and mesquite), 20% in shrub/scrub (acacia [mesquite], sage, and thornbush) and 30% open field desert shrub (acacia and sage).	Birds: kingbird Mammals: Kangaroo rat burrows
EUP02 – terrestrial	Patchy vegetation with 5% of location wooded (mesquite), 60% in shrub/scrub (creosote, mesquite, saguaro, and barrel cactus) and 40% open field desert (creosote, mesquite, saguaro, and barrel cactus). Dead ocotillo trees were observed. Some signs of surface water flow.	Birds: Phainopepla, Say's phoebe Mammals: Rodent burrows (kangaroo rat and pocket mouse), deer, and antelope squirrel
EUP03 – terrestrial	Patchy vegetation with 10% of location mixed wooded (paloverde and mesquite), 40% in shrub/scrub (creosote) and 60% open field desert shrub (creosote, cholla, and mesquite). Scattered saguaro, barrel (hedgehog) cactus, and prickly pear were also observed.	Birds: gnatcatchers, Say's phoebe, sparrows, and quail Mammals: Rodent burrows (kangaroo rat and pocket mouse), rabbit, and squirrel
EUP04 – terrestrial	Patchy to sparse vegetation with 10% of location mixed wooded (mostly paloverde, some mesquite), 10% in shrub/scrub (jojoba and bunchgrass) and 70% open field rocky (bunchgrass).	Birds: gnatcatcher, and turkey vulture Mammals: Rodent burrows
EUP05 – terrestrial	Sparse vegetation with 20% of location mixed wooded (paloverde and mesquite with possible *Atriplex* understory), 10% in shrub/scrub (creosote) and 50% open field disturbed/road (grass and gravel). Scattered barrel cactus also observed.	Birds: gnatcatcher, swallows, and sparrows Mammals: Rodent burrows
GR01 – terrestrial	Sparse vegetation with 36% of location deciduous wooded (willow with bare understory) and 10% in shrub/scrub (tamarisk). Scattered prickly pear, ruderal weeds, and grasses.	Birds: songbirds, marsh wren, house finch, turkey vulture, and yellow warbler Mammals: None observed
GR01 – aquatic	Gila River near mouth of a wash with bedrock of coarse sand, cobble, and gravel. Very little vegetation was present on banks. The water was muddy and had a velocity of greater than 300 cubic feet per second (cfs).	Birds: marsh wren, house finch, and yellow warbler
GR02 – terrestrial	Sparse vegetation with 70% of location deciduous wooded (tamarisk, cottonwood, and pepperwood with ruderal understory) and 20% in shrub/scrub (mostly tamarisk). Bare areas were also present.	Birds: riparian songbirds (marsh wren and song sparrow) Mammals: Some cow droppings

TABLE 4-40
Summary of Habitat and Wildlife Observations[1]
Remedial Investigation Report
ASARCO LLC Hayden, Arizona Plant Site

Survey Location	Habitat Observations	Wildlife Observations
GR02 – aquatic	Gila River with a fine silt/detritus/clay substrate and low grass covered banks. The river at this location was greater than 20 feet across and was muddy with cattails present.	Invertebrates: present Fish: possibly gambusia Birds: common yellowthroat, song sparrow, American goldfinch, and mallard Mammals: None observed
GR03 – terrestrial	Patchy to sparse vegetation with 50% of location mixed wooded (tamarisk and cottonwood with grass/ruderal understory) and 10% in shrub/scrub (*Atriplex* and tamarisk). Scattered *Atriplex*, tamarisk, and prickly pear also observed.	Birds: cliff swallows, and song sparrows Mammals: none observed
GR03 – aquatic	Gila River with a fine silt/cobble/slick clay substrate and low banks covered with grass and small forbs/shrubs. The river at this location was greater than 30 feet across and was muddy and had tamarisk and grasses in stream.	Invertebrates: mayfly larvae, diptera larvae Birds: songbirds (marsh wren) Mammals: possible mountain lion scat
GR04 – terrestrial[2]	Patchy vegetation with 60% of location mixed wooded (tamarisk, cat's claw, and dead cottonwood with grass/ruderal understory) and 10% in shrub/scrub (tamarisk).	No wildlife observed
GR04 – aquatic	Gila River with a fine silt/debris/cobble/slick clay substrate and low banks covered with ruderal plants and grasses. The river at this location was 30 feet across and was muddy and had tamarisk and grasses in stream.	Invertebrates: benthic invertebrates present Birds: common raven Mammals: rabbits
GR05 – terrestrial	Sparse vegetation with 50% of location evergreen wooded (tamarisk with sparse tamarisk and some ruderal vegetation understory) and 10% in shrub/scrub (tamarisk).	Birds: American goldfinch, common raven, and cliff swallows Mammals: some small burrows
GR05 – aquatic	Gila River with a course sand/cobble/gravel substrate and steep banks to low beaches. Bank vegetation ranged from sparsely vegetated to thick tamarisk. The river at this location was 100 feet across and was muddy with no aquatic vegetation.	Invertebrates: benthic invertebrates present Birds: black phoebe, swallows Mammals: None observed
GR06 – terrestrial	Sparse vegetation with 50% of location mixed wooded (cottonwood, willow, and tamarisk with cat's claw, tamarisk and mulefat understory) and 10% in shrub/scrub (tamarisk).	Birds: wrentit Mammals: burrows and cows
GR06 – aquatic	Gila River with a fine silt substrate and low sloping (over 4 feet at edges) banks covered with grass. The river at this location was 20 feet across and was muddy with no aquatic vegetation.	Birds: marsh wren and turkey vulture Mammals: cows
GR07 – terrestrial	Sparse vegetation with 30% of location mixed wooded (tamarisk and a few large willows with tamarisk and dead tamarisk understory).	Birds: sparrows, warblers, wrens Mammals: some burrows and gopher

TABLE 4-40
Summary of Habitat and Wildlife Observations[1]
Remedial Investigation Report
ASARCO LLC Hayden, Arizona Plant Site

Survey Location	Habitat Observations	Wildlife Observations
GR07 – aquatic	Gila River with an unknown substrate (possibly silt). Banks were vertical and then flat at first terrace with mostly bare dirt and some grasses. The shore was about 10 to 12 feet deep bordered by a 10- to 12-foot cliff. Mulefat and some tamarisk on banks. The river at this location was 20 feet across, about 2 feet deep, and was muddy with typha up and down the stream.	Invertebrates: possible benthic invertebrates in typha Birds: red-winged blackbird, marsh wren, and tree swallow Mammals: mammal burrows and gophers
GR08 – terrestrial	Sparse vegetation with 30% of location wooded (willow, tamarisk, and mesquite with grasses and duff understory) and 10% in shrub/scrub (tamarisk).	Birds: songbirds, marsh wrens, song sparrows Mammals: mammal burrows
GR08 – aquatic	Gila River with an unknown substrate (possibly silt). Banks were vertical undercut then flat to the terrace with grass cover. The river at this location was 30 feet across, about 3 feet deep, and was muddy with no aquatic vegetation.	Birds: American goldfinch, vermillion flycatcher, marsh wren, and tree swallow Mammals: small mammals
GR09 – terrestrial	Dense vegetation with 80% of location mixed wooded (tamarisk and some willow with tamarisk/mulefat understory) and 30% in shrub/scrub (tamarisk/mulefat).	Birds: marsh wrens, finches, songbirds Mammals: possible bobcat scat, rodent burrows, and fox carcass
GR09 – aquatic	Gila River with an unknown substrate (possibly silt). Banks were flat with grass cover. Tamarisk and mulefat as well as some cottonwood regeneration were observed on the banks. Additionally, typha were coming in with the cottonwoods. The river at this location was 30 feet across, about 3 feet deep, and was muddy with some fragmities upstream of the location.	Birds: great blue heron, American goldfinch, marsh wren, tree swallow, and common black-hawk Mammals: mammal burrows and horses
GR10 – terrestrial	Patchy vegetation with 20% of location mixed wooded (cottonwood, tamarisk, and willow with tamarisk/mulefat understory) and 50% in shrub/scrub (tamarisk and mulefat). The location was crossed by an arroyo/gulley consisting of bare gravel. Possible plant stress observed.	Birds: towhee, finches, sparrows Mammals: rodent burrows, bobcat, raccoon, and canid scat
GR10 – aquatic	Gila River with an unknown substrate (possibly silt). Banks were flat with grass cover. Tamarisk, mulefat, some ruderals, and a few mesquite were observed on the banks. The river at this location was 30 feet across, about 1 foot deep, and was muddy with some fragmities upstream of the location.	Birds: marsh wren, tree swallow, killdeer, mallard, and towhee Mammals: mammal scat (bobcat, raccoon, canid) and horses

TABLE 4-40
Summary of Habitat and Wildlife Observations[1]
Remedial Investigation Report
ASARCO LLC Hayden, Arizona Plant Site

Survey Location	Habitat Observations	Wildlife Observations
GR11 – terrestrial	Sparse vegetation with 35% of location mixed wooded (willow, tamarisk, and cottonwood with tamarisk understory) and 10% in shrub/scrub (tamarisk). The location was crossed by a wash/gulley.	Birds: warblers, finches, vermillion flycatcher (pair), and Cassins kingbird Mammals: gopher and raccoon scat
GR-11 – aquatic	Gila River with an unknown substrate (possibly silt). Banks were flat with grass cover interspersed with ruderals, tamarisk, and mulefat. The river at this location was 25 feet across and was muddy with no aquatic vegetation.	Fish: small fish (gambusia) Birds: Say's phoebe, black phoebe, American goldfinch, junco, and marsh wrens Mammals: None observed
GR12 – terrestrial	Sparse vegetation with 35% of location mixed wooded (tamarisk and mesquite with sparse lantana and grass understory) and 10% in shrub/scrub (mesquite).	Birds: tree swallow, American goldfinch, song sparrow, common raven Mammals: mammal burrows
GR13 – terrestrial	Dense vegetation with 75% of location evergreen wooded (tamarisk with tamarisk and downed vegetation understory) and 80% in shrub/scrub (tamarisk and downed vegetation).	Birds: American goldfinch and song sparrow Mammals: gopher burrows and rabbits
GR14 – terrestrial	Sparse vegetation with 60% of location mixed wooded (cottonwood, willow, and cat's claw with mulefat and tamarisk understory) and less than 10% in shrub/scrub (mulefat and tamarisk). Fast flowing braided channel adjacent to location with grass in the channel.	Birds: tree swallows Mammals: mammal burrows in cliff face
GR15 – terrestrial	Sparse vegetation with 70% of location mixed wooded (tamarisk, some mesquite, and a couple cottonwoods with a mesquite and grass understory) and 40% in shrub/scrub (tamarisk).	Birds: mourning dove, American goldfinch, sparrows, swallows Mammals: cottontail and gopher burrows, coyote scat, and cow pies
GR16 – terrestrial	Patchy vegetation with 60% of location mixed wooded (willow, cottonwood, and tamarisk with a mulefat, mesquite, and grass understory) and 30% in shrub/scrub (mulefat and mesquite). Some wetland habitat was also present at the survey location. The soils in this area were saturated and small patches of typha and sedges were observed.	Invertebrates: Jerusalem crickets Birds: marsh wren, song sparrow, American goldfinch Mammals: gopher, rodent, cow pies
GRREF01 – terrestrial	Patchy vegetation with 35% of location mixed wooded (mesquite and tamarisk with no understory) and 60% in disturbed open field (mesquite, some ruderals, and grasses). Mesquite generation was observed.	Birds: Phainopepla, vermillion flycatcher, American goldfinch, and mourning dove Mammals: rodent burrows
GRREF01 – aquatic	Gila River with an unknown substrate (possibly silt). Banks had a gentle slope with grass cover interspersed with mulefat and some tamarisk. The river at this location was 30 feet across, about 1.5 feet deep, and was muddy with no aquatic vegetation.	Birds: American goldfinch, marsh wren, and tree swallow Mammals: cows

TABLE 4-40
Summary of Habitat and Wildlife Observations[1]
Remedial Investigation Report
ASARCO LLC Hayden, Arizona Plant Site

Survey Location	Habitat Observations	Wildlife Observations
SPR01 – aquatic	San Pedro River with only small pools of non-flowing water. The substrate was coarse sand and grasses and ruderal vegetation were present in the streambed.	Invertebrates: beetles in pools Birds: vermillion flycatcher, American goldfinch, and song sparrow Mammals: None observed
SPR02 – terrestrial	Patchy vegetation with 20% of location mixed wooded (tamarisk and some small cottonwood with a tamarisk and cat's claw understory) and 60% in shrub/scrub (tamarisk and cat's claw).	Birds: common raven and cliff swallows Mammals: None observed

Table Notes:

[1] Detailed checklists for the survey locations are provided in Appendix C (*ASARCO LLC Hayden Plant Site: Summary of Ecological Evaluation Site Visit of April 27-28, 2006*).

[2] Possible signs of stressed upland vegetation.

TABLE 5-1
Summary of Initial Screening Evaluation for Aquatic Ecological Receptors
Remedial Investigation
ASARCO LLC Hayden Plant Site, Hayden, Arizona

Analyte	Aquatic Organisms[2]	Benthic Invertebrates	Swallows	Belted Kingfisher	Little Brown Bat	Mink
On-Site Gila River						
Aluminum	**r (Retain)**	r (N)	r (NU)	r (NU)	**r (L, pH)**	**r (L, pH)**
Antimony	d	r (N)	u	u	r (N)	d
Arsenic	d	d	d	d	r (D)	d
Barium	**r (Retain)**	d	d	d	d	d
Beryllium	**r (ND/DET)**	u	u	u	**r (NU)**	d
Boron	**r (Retain)**	u	d	d	d	d
Cadmium[1]	**r (ND/DET)**	d	r (D)	**r (L)**	d	r (D)
Calcium	r (low FE)	--	--	--	--	--
Chromium	d	d	d	d	d	d
Cobalt	r (low FE)	u	d	d	d	d
Copper[1]	r (low FE)	r (low FE)	r (D)	d	**r (L)**	d
Cyanide	**r (ND/DET)**	**r (ND, L)**	u	u	r (N)	d
Iron	**r (Retain)**	d	**r (L)**	r (D)	**r (NU)**	**r (NU)**
Lead[1]	r (low FE)	d	r (N)	r (N)	r (D)	d
Manganese	**r (Retain)**	r (low FE)	r (D)	d	r (D)	d
Mercury[1]	**r (ND/DET)**	d	r (D)	**r (L)**	r (N)	**r (L)**
Molybdenum	d	u	d	d	r (N)	d
Nickel	d	r (N)	d	d	d	d
Selenium	r (low FE)	r (ND, N)	r (D)	r (D)	r (D)	r (D)
Silver	**r (ND)**	r (ND, N)	r (D)	d	r (D)	d
Strontium	--	u	u	u	d	d
Thallium	d	u	r (N)	d	d	d
Vanadium	r (low FE)	u	r (D)	d	r (N)	d
Zinc	d	d	r (D)	r (N)	d	d
Total Dissolved Solids	r (low FE)	--	--	--	--	--
Ammonia as N	d	--	--	--	--	--
p,p'-DDE	--	r (ND, N)	r (N)	d	d	d
On-Site San Pedro River						
Aluminum	**r (Retain)**	r (N)	r (NU)	r (NU)	**r (L, pH)**	**r (L, pH)**
Antimony	d	d	u	u	r (N)	d
Arsenic	d	d	d	d	r (D)	d
Barium	**r (Retain)**	d	d	d	d	d
Beryllium	**r (Retain)**	u	u	u	**r (NU)**	d
Boron	**r (Retain)**	u	d	d	d	d
Cadmium[1]	**r (ND)**	d	r (D)	**r (L)**	d	d
Calcium	**r (Retain)**	--	--	--	--	--
Chromium	d	d	d	d	d	d
Cobalt	d	u	d	d	d	d
Copper[1]	d	r (N)	r (D)	d	r (N)	d
Cyanide	**r (ND)**	**r (ND, L)**	u	u	r (N)	d
Iron	**r (Retain)**	d	**r (L)**	d	**r (NU)**	**r (NU)**
Lead[1]	d	d	r (N)	d	r (D)	d
Manganese	**r (Retain)**	r (N)	r (D)	d	r (D)	d
Mercury[1]	**r (ND)**	d	r (D)	r (N)	r (D)	r (D)

TABLE 5-1

Summary of Initial Screening Evaluation for Aquatic Ecological Receptors

Remedial Investigation

ASARCO LLC Hayden Plant Site, Hayden, Arizona

Analyte	Aquatic Organisms[2]	Benthic Invertebrates	Swallows	Belted Kingfisher	Little Brown Bat	Mink
Molybdenum	d	u	d	d	r (N)	d
Nickel	d	d	d	d	d	d
Selenium	d	r (N)	r (N)	r (N)	**r (L)**	d
Silver	**r (ND)**	r (N)	r (N)	d	r (D)	d
Strontium	--	u	u	u	d	d
Thallium	d	u	r (N)	d	d	d
Vanadium	**r (Retain)**	u	d	d	r (N)	d
Zinc	d	d	r (D)	d	d	d
Total Dissolved Solids	**r (Retain)**	--	--	--	--	--
Ammonia as N	d	--	--	--	--	--
p,p'-DDE	--	r (N)	r (N)	d	d	d

Table Notes:

[1] Dissolved fraction of some metals used for aquatic organism evaluation

[2] Site-specific fish monitoring data do not exclude or support potential for risk

[3] Columns present results of the initial assessment and the refined assessment which are displayed in parentheses.

[4] Bold results indicate that a contaminant could not be excluded, for various reasons (e.g. insufficient detection limits or lac

[5] Highlighted results indicate conclusion of possible risk.

[6] Initial assessment codes are as follows:

- = not evaluated

d = Dropped from further analysis. Exposure concentration did not exceed screening benchmarks

r = COPEC could not be excluded from presenting a potential risk to receptor and was evaluated further in the refinem

u = Uncertainty; no receptor screening value available

[7] Refined assessment codes are as follows:

D = NOAEL not exceeded in the refinement; determination of no unacceptable risk

FE Low = The frequency of screening value exceedances is low (<20%).The likelihood of adverse effects is low and w

L = LOAEL/High-TRV exceedance in refinement; possible risk to populations or communities (as applicable)

N = NOAEL/Low-TRV exceedance in refinement but not the LOAEL/High-TRV; determination of no unacceptable risk

ND = Exceedances based on concentrations less than the detection limit. Risks are uncertain, but cannot be excludec

ND/Det = The maximum non-detected value exceeded the maximum detected value and both exceeded the screenin

NU = NOAEL exceedance in refinement; a LOAEL was unavailable therefore, risk is uncertain

pH = Although risks from exposure to aluminum were predicted, the pH in sediments at the Site are greater than 5.5.

Retain = COPEC did not pass refined screening and could not be excluded as a risk driver

TABLE 5-2
Summary of Refined Risk Evaluation for Terrestrial Ecological Receptors
Remedial Investigation
ASARCO LLC Hayden Plant Site, Hayden, Arizona

Analyte	Terrestrial Plants[1]	Terrestrial Invertebrates[1]	Terrestrial Microbes[1]	Mourning Dove	Curve-billed Thrasher	Red-tailed Hawk	Southwestern Willow Flycatcher[2]	Desert Cottontail	Desert Shrew	Coyote
Middle Gila River - On-Site Combined Stable and Unstable Riparian Soil and Surface Water										
Antimony	d	d	u	u	u	u	u	d	r (B)	d
Arsenic	**n (Retain GW)**	d	d	d	d	d	d	r (B)	r (B)	d
Beryllium	d	d	u	u	u	u	u	d	d	r (B)
Boron	r (B)	u	r (B)	r (B)	d	d	d	r (B)	d	d
Cadmium	d	d	d	d	r (B)	d	r (B)	d	r (B)	d
Chromium	r (B)	r (B)	r (B)	d	r (B)	d	r (B)	d	r (B)	d
Copper	r (B)	r (B)	r (B)	d	r (B)	d	r (B)	d	r (B)	d
Cyanide	u	u	u	u	u	u	u	d	r (B)	d
Lead	d	d	d	r (B)	r (B)	r (B)	r (B)	d	r (B)	d
Mercury	d	r (FE)	d	d	r (D)	d	**r (Poss)**	d	r (N)	d
Molybdenum	r (B)	u	d	d	d	d	r (B)	r (B)	r (B)	r (B)
Selenium	**r (ND)**	d	d	d	r (D)	d	r (D)	d	r (D)	d
Silver	d	u	d	d	r (D)	d	r (D)	d	r (D)	d
Thallium	**r (ND)**	u	u	r (N)	**r (L, ND)**	r (N)	**r (Poss, ND)**	d	d	d
Vanadium	r (B)	u	r (B)	d	d	d	d	r (B)	r (B)	d
Zinc	r (B)	r (B)	r (B)	d	r (B)	r (B)	r (B)	d	d	d
Middle Gila River - On-Site Stable Riparian Soil and Surface Water										
Aluminum	d	d	d	r (B)	r (B)	r (B)	r (B)	r (B)	r (B)	r (B)
Barium	d	d	d	d	d	d	d	d	d	d
Cobalt	d	u	d	d	d	d	d	d	d	d
Iron	r (B)	u	r (B)	r (B)	r (B)	r (B)	r (B)	r (B)	r (B)	r (B)
Manganese	**r (B, Retain GW)**	r (B)	r (B)	d	d	d	d	d	d	d
Nickel	d	d	d	d	d	d	d	d	r (B)	d

TABLE 5-2
Summary of Refined Risk Evaluation for Terrestrial Ecological Receptors
Remedial Investigation
ASARCO LLC Hayden Plant Site, Hayden, Arizona

Analyte	Terrestrial Plants[1]	Terrestrial Invertebrates[1]	Terrestrial Microbes[1]	Mourning Dove	Curve-billed Thrasher	Red-tailed Hawk	Southwestern Willow Flycatcher[2]	Desert Cottontail	Desert Shrew	Coyote
Middle Gila River - On-Site Unstable Riparian Soil and Surface Water										
Aluminum	d	d	d	r (B)	r (B)	r (B)	r (B)	r (B)	r (B)	r (B)
Barium	d	d	d	d	d	d	d	d	d	d
Cobalt	r (FE)	u	d	d	d	d	d	d	d	d
Iron	r (B)	u	r (B)	r (B)	r (B)	r (B)	r (B)	r (B)	r (B)	r (B)
Manganese	**r (B, Retain GW)**	r (B)	r (B)	d	d	d	d	d	d	d
Nickel	d	d	d	d	d	d	d	d	r (B)	d
San Pedro River - On-Site Combined Stable and Unstable Riparian Soil and Surface Water										
Antimony	d	d	u	u	u	u	u	d	r (B)	d
Arsenic	d	d	d	d	d	d	d	d	d	d
Beryllium	d	d	u	u	u	u	u	d	d	r (B)
Boron	r (B)	u	d	d	d	d	d	d	d	d
Cadmium	d	d	d	d	r (B)	d	r (B)	d	r (B)	d
Chromium	r (B)	r (B)	r (B)	d	r (B)	d	r (B)	d	r (B)	d
Copper	r (B)	r (B)	r (B)	d	r (B)	d	r (B)	d	r (B)	d
Cyanide	u	u	u	u	u	u	u	d	r (B)	d
Lead	d	d	d	r (B)	r (B)	r (B)	r (B)	d	r (B)	d
Mercury	d	r (low FE)	d	d	r (D)	d	**r (Poss)**	d	r (N)	d
Molybdenum	r (B)	u	d	d	d	d	d	r (B)	r (B)	d
Selenium	**r (ND)**	d	d	d	r (D)	d	**r (Poss, ND)**	d	**r (L, ND)**	d
Silver	d	u	d	d	r (D)	d	r (D)	d	r (D)	d
Thallium	**r (ND)**	u	u	r (N)	**r (L, ND)**	r (N)	**r (Poss, ND)**	d	d	d
Vanadium	r (B)	u	r (B)	d	d	d	d	d	r (B)	d
Zinc	r (B)	d	d	d	r (B)	r (B)	**r (B, MT)**	d	d	d

TABLE 5-2
Summary of Refined Risk Evaluation for Terrestrial Ecological Receptors
Remedial Investigation
ASARCO LLC Hayden Plant Site, Hayden, Arizona

Analyte	Terrestrial Plants[1]	Terrestrial Invertebrates[1]	Terrestrial Microbes[1]	Mourning Dove	Curve-billed Thrasher	Red-tailed Hawk	Southwestern Willow Flycatcher[2]	Desert Cottontail	Desert Shrew	Coyote
San Pedro River - On-Site Stable Riparian Soil and Surface Water										
Aluminum	d	d	d	d	r (B)	d	r (B)	r (B)	r (B)	r (B)
Barium	d	d	d	d	d	d	d	d	d	d
Cobalt	d	u	d	d	d	d	d	d	d	d
Iron	r (B)	u	r (B)	r (B)	r (B)	r (B)	r (B)	r (B)	r (B)	r (B)
Manganese	d	d	r (B)	d	d	d	d	d	d	d
Nickel	d	d	d	d	d	d	d	d	r (B)	d
San Pedro River - On-Site Untable Riparian Soil and Surface Water										
Aluminum	d	d	d	r (B)	r (B)	r (B)	r (B)	r (B)	r (B)	r (B)
Barium	d	d	d	d	d	d	d	d	d	d
Cobalt	d	u	d	d	d	d	d	d	d	d
Iron	r (B)	u	r (B)	r (B)	r (B)	r (B)	r (B)	r (B)	r (B)	r (B)
Manganese	r (B)	r (B)	r (B)	d	d	d	d	d	d	d
Nickel	d	d	d	d	d	d	d	d	r (B)	d
Upland Soils and Gila River Surface Water										
Aluminum	d	d	d	r (B)	r (B)	r (B)	r (B)	r (B)	r (B)	r (B)
Antimony	r (B)	d	u	u	u	u	u	d	r (B)	r (B)
Arsenic	**r (Retain)**	**r (Retain)**	r (low FE)	r (D)	d	d	d	r (N)	**r (L)**	r (D)
Barium	d	d	d	d	d	d	d	d	d	d
Beryllium	d	d	u	u	u	u	u	d	d	r (B)
Boron	r (B)	u	d	d	d	d	d	d	d	d
Cadmium	r (FE low)	d	r (low FE)	**r (L)**	**r (L)**	r (N)	**r (Prob)**	d	**r (L)**	d
Chromium	r (B)	r (B)	r (B)	r (B)	r (B)	d	r (B)	d	r (B)	d
Cobalt	**r (Retain)**	u	d	d	r (D)	d	r (D)	d	r (D)	d
Copper	**r (Retain)**	**r (Retain)**	**r (Retain)**	**r (L)**	**r (L)**	d	**r (Prob)**	**r (L)**	**r (L, T)**	**r (L)**
Cyanide	u	u	u	u	u	u	u	d	r (B)	d
Iron	r (B)	u	r (B)	r (B)	r (B)	r (B)	r (B)	r (B)	r (B)	r (B)
Lead	**r (Retain)**	d	d	**r (L)**	**r (L)**	**r (L)**	**r (Prob)**	**r (D, T)**	**r (L, T)**	r (D)

TABLE 5-2
Summary of Refined Risk Evaluation for Terrestrial Ecological Receptors
Remedial Investigation
ASARCO LLC Hayden Plant Site, Hayden, Arizona

Analyte	Terrestrial Plants[1]	Terrestrial Invertebrates[1]	Terrestrial Microbes[1]	Mourning Dove	Curve-billed Thrasher	Red-tailed Hawk	Southwestern Willow Flycatcher[2]	Desert Cottontail	Desert Shrew	Coyote
Manganese	r (B)	r (B)	r (B)	d	d	d	d	d	d	d
Mercury	r (FE low)	**r (Retain)**	d	d	r (N)	d	**r (Poss)**	d	r (N)	d
Molybdenum	**r (Retain)**	u	r (low FE)	**r (L)**	**r (L)**	**r (L)**	**r (Prob)**	**r (L)**	**r (L)**	**r (L)**
Nickel	r (B)	r (B)	d	d	d	d	d	d	r (B)	d
Selenium	**r (Retain)**	d	d	**r (L)**	**r (L)**	d	**r (Prob)**	**r (L)**	**r (L)**	d
Silver	d	u	d	d	**r (L)**	r (D)	**r (Prob)**	d	r (N)	d
Thallium	**r (ND)**	u	u	r (B)	r (B)	r (B)	r (B)	d	d	d
Vanadium	r (B)	u	r (B)	d	d	d	d	r (B)	r (B)	d
Zinc	**r (Retain)**	**r (Retain)**	**r (Retain)**	r (N)	**r (L)**	r (N)	**r (Prob, MT)**	d	**r (L)**	d
Wash Soils and Gila River Surface Water										
Aluminum	d	d	d	r (B)	r (B)	r (B)	r (B)	r (B)	r (B)	r (B)
Antimony	r (B)	d	u	u	u	u	u	r (B)	r (B)	r (B)
Arsenic	**r (Retain)**	r (low FE)	d	d	d	d	d	r (D)	r (N)	d
Barium	d	d	d	d	d	d	d	d	d	d
Beryllium	d	d	u	u	u	u	u	d	d	r (B)
Boron	r (B)	u	d	d	d	d	d	d	d	d
Cadmium	d	d	d	r (N)	**r (L)**	d	**r (Prob)**	d	**r (L)**	d
Chromium	r (B)	r (B)	r (B)	r (B)	r (B)	r (B)	r (B)	d	r (B)	d
Cobalt	**r (Retain)**	u	d	d	r (N)	d	r (D)	d	r (D)	d
Copper	**r (Retain)**	**r (Retain)**	**r (Retain)**	r (D)	**r (L)**	d	**r (Prob)**	r (N)	**r (L, T)**	r (D)
Cyanide	u	u	u	u	u	u	u	d	r (B)	d
Iron	r (B)	u	r (B)	r (B)	r (B)	r (B)	r (B)	r (B)	r (B)	r (B)
Lead	r (B)	d	d	r (B)	r (B)	r (B)	r (B)	r (B)	r (B)	d
Manganese	r (B)	r (B)	r (B)	d	d	d	d	d	d	d
Mercury	r (low FE)	r (low FE)	d	d	r (N)	d	**r (Poss)**	d	r (N)	d
Molybdenum	**r (Retain)**	u	d	r (N)	r (N)	r (N)	**r (Poss)**	**r (L)**	**r (L)**	r (N)
Nickel	r (B)	d	d	d	d	d	r (B)	d	r (B)	d
Selenium	r (B)	d	d	r (B)	r (B)	d	r (B)	r (B)	r (B)	d

TABLE 5-2
Summary of Refined Risk Evaluation for Terrestrial Ecological Receptors
Remedial Investigation
ASARCO LLC Hayden Plant Site, Hayden, Arizona

Analyte	Terrestrial Plants[1]	Terrestrial Invertebrates[1]	Terrestrial Microbes[1]	Mourning Dove	Curve-billed Thrasher	Red-tailed Hawk	Southwestern Willow Flycatcher[2]	Desert Cottontail	Desert Shrew	Coyote
Silver	d	u	d	d	r (N)	r (D)	**r (Poss)**	d	r (N)	d
Thallium	**r (ND)**	u	u	r (B)	r (B)	r (B)	r (B)	d	r (B)	d
Vanadium	r (B)	u	r (B)	d	d	d	d	r (B)	r (B)	d
Zinc	**r (Retain)**	**r (Retain)**	**r (Retain)**	r (N)	r (N)	r (N)	**r (Prob)**	d	r (N)	d

Table Notes:

[1] Potential effects only from direct contact with Site soils were evaluated for non-wildlife receptors.

[2] Special Status Species. Evaluated at the individual level. Population studies of southwestern willow flycatchers in the vicinity of the Site do not exclude or support potential for risk.

[3] Columns present results of the initial assessment and the refined assessment which are displayed in parentheses.

[4] Bold results indicate that a contaminant could not be excluded, for various reasons (e.g. insufficient detection limits or lack of a LOAEL), from posing a risk.

[5] Highlighted results indicate conclusion of possible risk.

[6] Initial assessment codes are as follows:

- = not evaluated
d = Dropped from further analysis. Exposure concentration did not exceed low-screening value
r = COPEC could not be excluded from presenting a potential risk to receptor and was evaluated further in the refinement
u = Uncertainty; no receptor screening value available

[7] Refined assessment codes are as follows:

B = Did not differ from background concentrations and is not a site-associated contaminant
D = NOAEL not exceeded in the refinement; determination of no unacceptable risks.
FE Low = The frequency of screening value exceedances is low (≤20%).The likelihood of adverse effects is low and was excluded.
L = LOAEL exceedance in refinement; possible risk populations or communities (as applicable)
MT = Measured egg tissue concentrations exceeded toxicity threshold; therefore, possible risk. (Note: Egg was collected near San Pedro River, so results were applied to the San Pedro River riparian soils and to the upland soils.)
N = NOAEL exceedance in refinement but not the LOAEL; determination of no unacceptable risks to populations or communities (as applicable)
ND = Exceedances based on concentrations less than the detection limit. Risks are uncertain, but cannot be excluded.
NU = NOAEL exceedance in refinement; a LOAEL was unavailable therefore, risk is uncertain
Poss = NOAEL exceedance in refinement but not the LOAEL; possible risk to individuals.
Prob = LOAEL exceedance in refinement; probable risk to individuals
Retain = COPEC did not pass refined screening and could not be excluded as a risk driver
Retain GW = Groundwater concentrations exceeded the screening benchmark; considered to pose a possible risk, even if soil data predicted no risk or if onsite soil concentrations were similar to background.
T = Estimated tissue concentrations (either kidney or liver, or both) exceeded toxicity thresholds; therefore, possible risk.