Arizona Air Quality Designations Technical Support Document

Boundary Recommendation for the 2008 Revision to the National Ambient Air Quality Standard for Lead

Air Quality Division

December 9, 2009

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TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES Page

APPENDICES Initial Reference Page

Arizona Air Quality Designations
Boundary Recommendations for the 2008
Lead National Ambient Air Quality Standard

EXECUTIVE SUMMARY

In October 2008, the U.S. Environmental Protection Agency (EPA) revised the existing National Ambient Air Quality Standard (NAAQS) for Lead (Pb). EPA's final rule for Pb, effective January 12, 2009, stated that the county in which violations of the Pb NAAQS had occurred would be the default boundary for Pb Nonattainment Areas within a state. Pb monitoring data has been collected by ADEQ at the JLG Supersite in Central Phoenix, by Freeport McMoRan in Miami, and contractors for EPA in Hayden. The one area in Arizona recommended as nonattainment consists of the Hayden portion of southern Gila and eastern Pinal Counties, the same boundaries as the existing Hayden Sulfur Dioxide (SO_2) Nonattainment Area and the de facto impact area if the ASARCO Ray Complex copper concentrating and smelting operations. Arizona recommends the rest of the state be designated as attainment/unclassifiable for the 2008 Pb NAAQS.

This recommendation follows careful consideration of the new Pb standard, requirements for designation of Nonattainment Areas, and options available for implementing the standard. This document demonstrates the impracticability of and lack of environmental benefit from designating the Nonattainment Area boundary based on EPA's default area definition. Because the state is recommending nonattainment boundaries that are less than all of Gila and Pinal Counties, the state must address the following nine criteria listed in the table below.

Table ES-1
Criteria for Nonattainment Boundary Recommendations

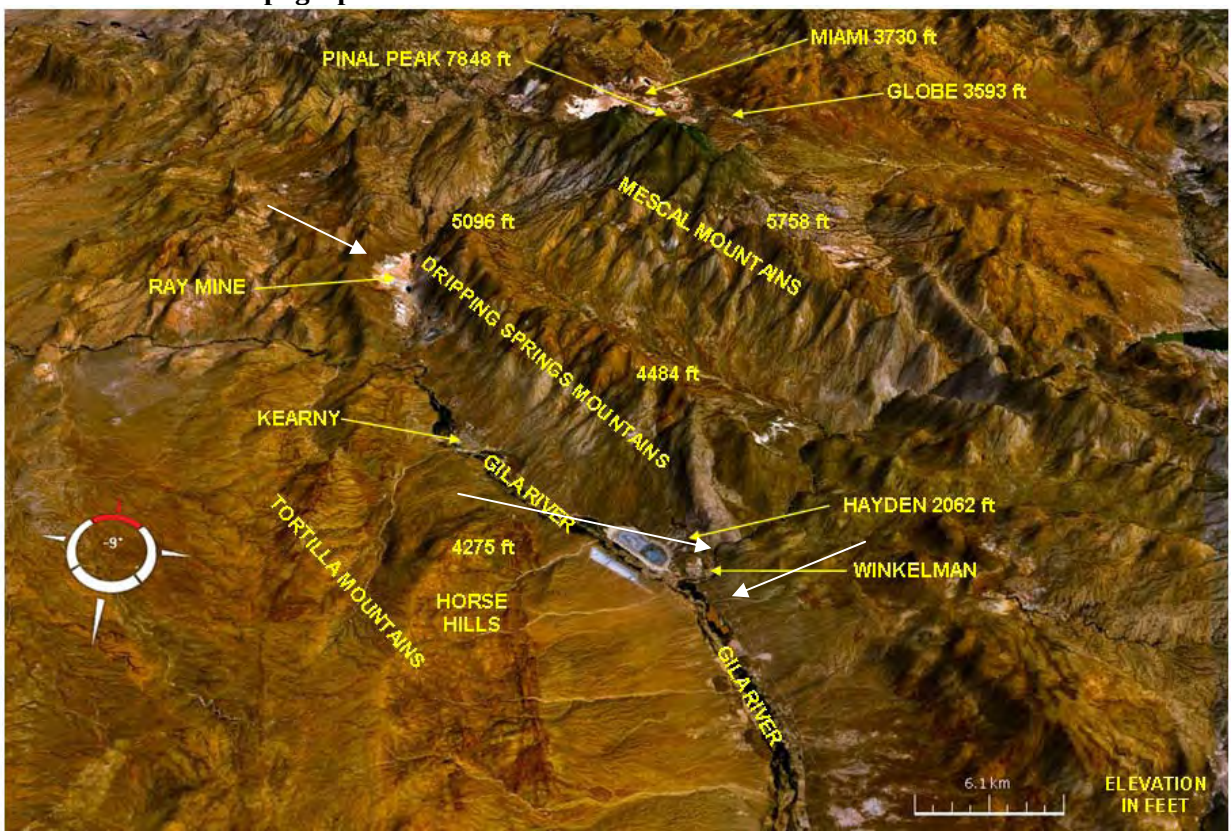
1. Emissions data (location of sources and contribution to Pb concentrations)
2. Air quality data
3. Population density and degree of urbanization (including commercial development)
4. Traffic and commuting patterns
5. Growth rates and patterns
6. Meteorology (weather and air movement patterns)
7. Geography/topography (mountain ranges or other air basin boundaries)
8. Jurisdictional boundaries (e.g., counties, air districts, existing nonattainment areas, etc.)
9. Level of control of emission sources.

The region in which the proposed Nonattainment Area is located is defined by complex terrain; rugged mountain ranges and canyons define airflow patterns within the region. The Gila River Airshed, where Hayden is located, is bordered by mountain ranges to the north, east, and west. These geographic boundaries separate the Hayden area from the remainder of Gila County and help to contain emissions from ASARCO's Ray Complex copper smelter and concentrator, which reside in the proposed Nonattainment Area. Figure ES-1 illustrates the complexity of the terrain that divides the Hayden area from most of Gila County. Weather patterns, the location of emission sources, a low potential for population growth, existing jurisdictional boundaries, and analyses of ambient monitoring data also support the exclusion of the majority of Gila and Pinal Counties from the Nonattainment Area. EPA agreed with the state's position that Hayden and the majority of Gila and Pinal Counties are in separate

airsheds in its October 2006 final rule separating the Hayden and Miami PM_{10} Nonattainment Areas.[1] Analysis supporting the state's nonattainment recommendations can be found in Section 4.0. The recommended Nonattainment Area also excludes Indian Country over which Arizona has no jurisdiction.

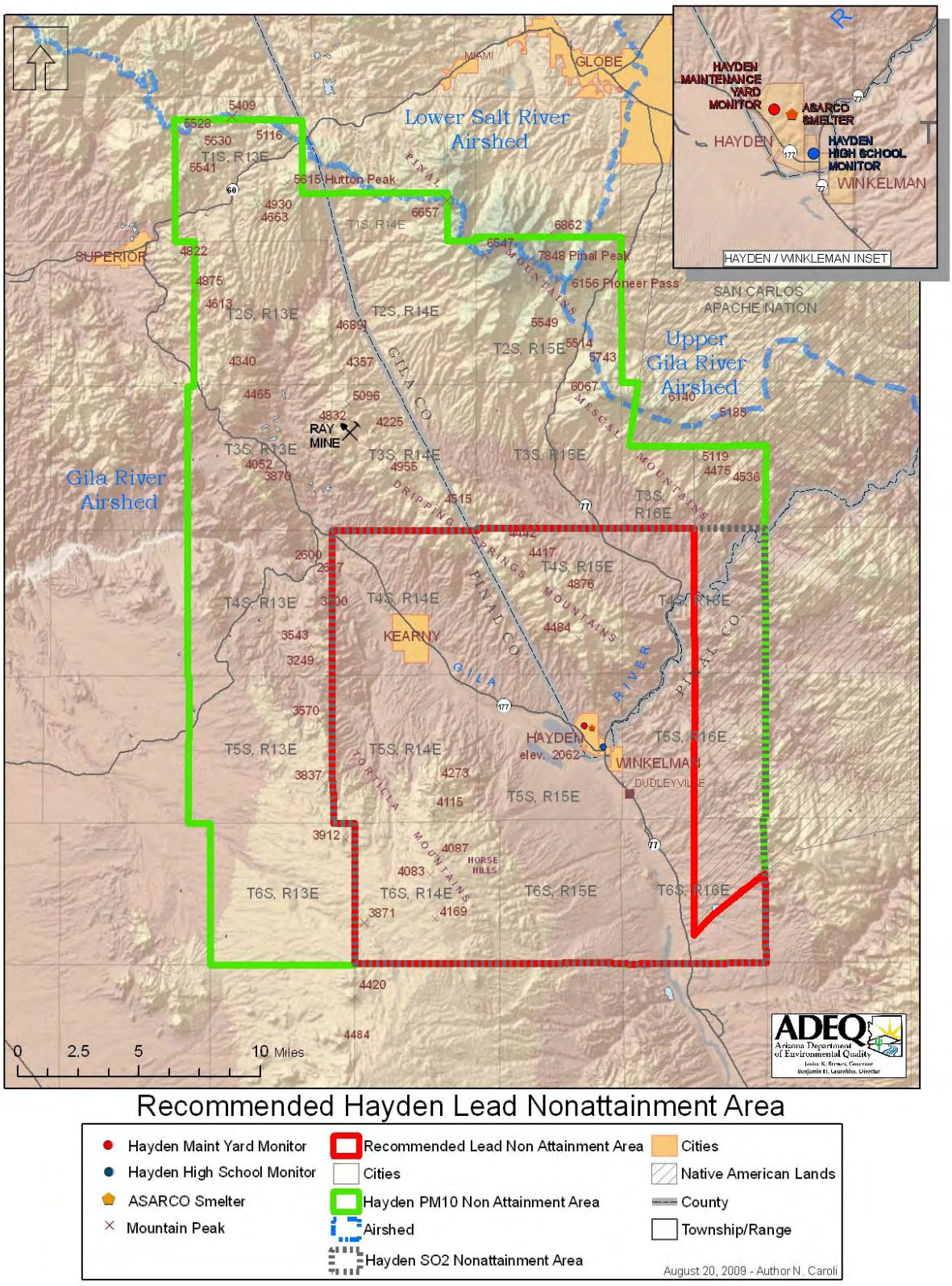
Arizona's alternative recommendation also includes designation as attainment/unclassifiable for the rest of the State, as explained in Section 3.0. Figure ES-2 illustrates the recommended Pb Nonattainment Area.

Figure ES-1
Topographical Features of Southern Gila and Pinal Counties



[1] On March 28, 2007, EPA approved ADEQ's request to split the existing Hayden-Miami PM_{10} Nonattainment Area into two separate PM_{10} Nonattainment Areas (72 FR 14422).

Figure ES-2
Pb Nonattainment Area Recommendation



Recommended Hayden Lead Nonattainment Area

- Hayden Maint Yard Monitor
- Hayden High School Monitor
- ASARCO Smelter
- Mountain Peak
- Recommended Lead Non Attainment Area
- Cities
- Hayden PM10 Non Attainment Area
- Airshed
- Hayden SO2 Nonattainment Area
- Cities
- Native American Lands
- County
- Township/Range

August 20, 2009 - Author N. Caroli

Arizona Air Quality Designations Boundary Recommendations for the 2008 Pb National Ambient Air Quality Standard

1.0 BACKGROUND

The U.S. Environmental Protection Agency (EPA) is charged with developing air quality standards for the protection of human health and the environment. As required by the Clean Air Act (CAA), EPA sets primary and secondary National Ambient Air Quality Standards (NAAQS) for six common air pollutants, one of which is Pb.[2] Maximum pollution levels or limits that are based on human health are called primary standards. Limits intended to prevent environmental and property damage are called secondary standards. EPA is required to evaluate and revise the standards if scientific analyses indicate new standards would be more protective of public health and welfare. Prior to 2008, the Pb standard was last revised in 1978.

The long-term health effects of Pb are severe; they include decreased growth, hyperactivity, impaired hearing, and even permanent brain damage. If detected early, these effects can be limited by reducing exposure to Pb and by receiving appropriate medical care. Children are particularly sensitive to the health effects of Pb. Prior to the conversion to an unleaded gasoline standard, vehicles were a significant source of Pb emissions. In Arizona, copper smelters and concentrators are currently one of the largest sources of ambient Pb emissions.

In 2008, following extensive analysis, EPA adopted a revised standard to provide more protection for children and other 'at risk' populations from exposure to elevated levels of Pb pollution. EPA lowered the primary Pb standard from 1.5 micrograms per cubic meter (1.5 $\mu g/m^3$) to 0.15 ug/m^3 (73 FR 66964; October 15, 2008). Concentrations are measured as Total Suspended Particles or TSP, a particle size range up to 45 micrometers in aerodynamic diameter. The secondary standard (for protection of the environment) was revised to a level identical to the primary standard. Table 1-1 compares the level of the 1978 Pb standard to the new 2008 standard.

Table 1-1
Comparison of Pb National Ambient Air Quality Standards

Standard	Level	Averaging Time	Form (Attainment Test)
1978 Standard	1.5 $\mu g/m^3$	Calendar Quarter	Maximum Arithmetic Mean
2008 Standard	0.15 $\mu g/m^3$	3 months	Rolling Three-Month Arithmetic Mean Concentration

[2] See http://www.epa.gov/air/criteria.html for a complete list of National Ambient Air Quality Standards.

2.0 AREA DESIGNATION CRITERIA

Under Clean Air Act (CAA) Section 107(d) the each state must make recommendations for areas that meet or do not meet new or revised NAAQS within one year following the promulgation of such standards. Each state's recommendations for the 2008 Pb standard is due by October 15, 2009. EPA anticipates promulgation of final Pb designations by October 2011.[3]

Section 107(d)(1)(A)(i) of the Clean Air Act (CAA) defines a nonattainment area as … *any area that does not meet (or that contributes to ambient air quality in a nearby area that does not meet) the national primary or secondary ambient air quality standard for the pollutant.* At present, EPA has not issued a guidance for areas found to be in nonattainment or deemed to be in attainment/unclassifiable for the Pb NAAQS. In the Pb final rule, however, EPA directed states to base nonattainment area boundary recommendations on a nine factor analysis similar to those established in EPA's 1997 8-hour ozone NAAQS, the 1997 $PM_{2.5}$ NAAQS, and the 2006 $PM_{2.5}$ NAAQS.

EPA recommends using county boundaries as the starting point or default boundary for evaluating the geographic boundaries of a Pb nonattainment area. To refine nonattainment boundaries for more appropriate recommendations (either larger or smaller boundaries than the default boundary) a state must perform an area-specific analysis that addresses the nine criteria discussed in the Executive Summary.

In addition, the state should affirm that the nonattainment area analysis demonstrates that: "1) violations are not occurring in nearby portions that are excluded from the recommended area, and 2) the excluded nearby portions do not contain emission sources that contribute meaningfully to the observed violations." ADEQ considered these factors in developing the recommended attainment, unclassifiable, and nonattainment boundaries, as detailed in Section 3.0.

[3] 40 CFR Part 51 – National Ambient Air Quality Standard for Lead; Final Rule, 73 FR 66964, November 12, 2008.

3.0 AREAS RECOMMENDED AS ATTAINMENT/UNCLASSIFIABLE

Areas recommended as attainment/unclassifiable include areas of the state where ambient Pb monitoring data are insufficient, where attainment of NAAQS has been demonstrated, and areas without significant point sources. For its analysis, ADEQ reviewed available ambient monitoring data and statistics for population density, degree of urbanization, traffic volume, commuting patterns, and jurisdictional boundaries. Table 3-1 discusses ADEQ's determination for each criterion.

ADEQ monitors ambient Pb concentrations in central Phoenix, but not throughout the state. Without sufficient monitoring data, the state cannot determine if an area is in nonattainment. The state plans to begin monitoring Pb concentrations in accordance with EPA's Pb final rule. Those counties without sufficient monitoring data which are recommended as attainment/unclassifiable are listed at the bottom of this page.

For its purposes, ADEQ reviewed ambient Pb monitoring data recorded by FMMI in Miami and data recorded by ADEQ in Phoenix. Monitoring data used to recommend the Hayden area of Gila and Pinal Counties as nonattainment is discussed in Section 4.0. For those portions of Gila County recommended as attainment/unclassifiable, ADEQ analyzed ambient Pb concentrations monitoring data for the Miami area collected by Freeport McMoRan Miami Inc. (FMMI) starting in January 2006 and ceasing in December 2008. Due to incomplete records, the monitoring data for the Miami area is indeterminate. ADEQ is recommending the Miami area be designated as attainment/unclassifiable.

Starting in January 2005, ADEQ has been monitoring Pb concentrations at the James L. Guyton (JLG) Supersite in central Phoenix. Monitoring data from this site has demonstrated that the state's most populous city is in attainment of the Pb NAAQS. Based on these data, ADEQ is able to discern that urban commercial operations, high population density, automobile emissions, high traffic volume, and high growth rates have a minimal impact on ambient Pb concentrations in Arizona. Ambient monitoring data is included in Appendix A.

Based on the analysis discussed above, ADEQ concludes the following full and partial counties are not experiencing or likely causing or contributing to an exceedance of the Pb NAAQS and, therefore, should be classified as attainment/unclassifiable. Sections of Gila and Pinal Counties recommended for nonattainment are discussed in Section 4.0. Figure 3-1 illustrates the location of Pb monitors in Arizona. Table 3-2 contains demographic data about each county in the state.

Table 3-1
Counties Recommended As Attainment/Unclassifiable

Apache County	Greenlee County	Pima County
Cochise County	La Paz County	Pinal County (Partial)
Coconino County	Maricopa County	Santa Cruz County
Gila County (Partial)	Mohave County	Yavapai County
Graham County	Navajo County	Yuma County

Figure 3-1
Pb Monitors in Arizona

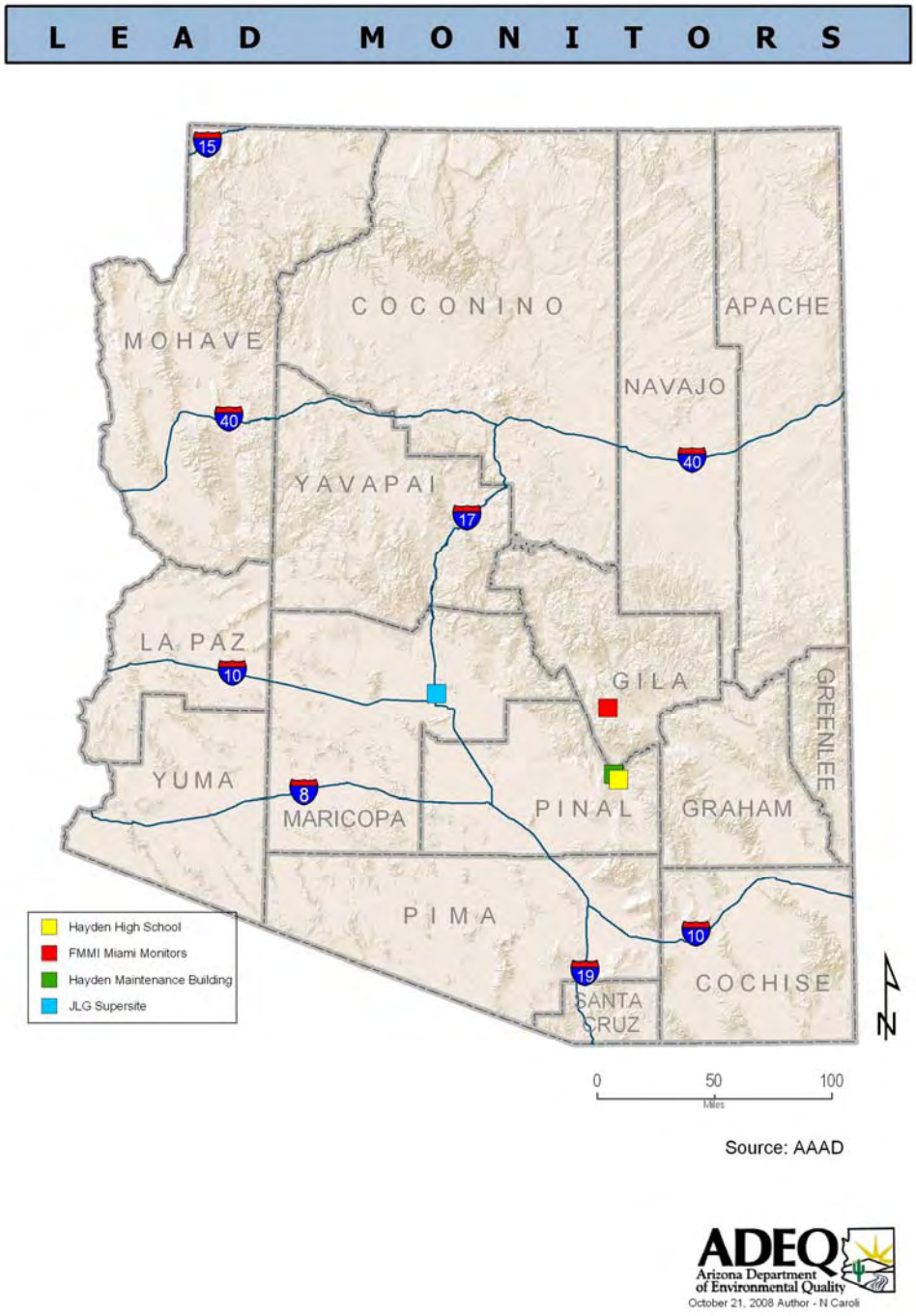


Table 3-2 Selected Arizona Demographic Data			
County/Largest City	**2008 Population**	**2008 Density (persons per square mile)**	**Area (square miles)**
Apache County	76,156	6.8	11,204.9
Eagar	4,810		
Cochise County	139,434	22.6	6,169.4
Sierra Vista	45,908		
Coconino County	135,613	7.3	18,617.4
Flagstaff	64,693		
Gila County	57,361	12.0	4,767.7
Payson	16,965		
Graham County	38,633	8.3	4,629.3
Safford	9,982		
Greenlee County	8,950	4.8	1,847.0
Clifton	2,616		
La Paz County	21,544	4.8	4,499.9
Quartzsite	3,692		
Maricopa County	3,987,942	433.3	9,203.1
Phoenix	1,561,485		
Mohave County	205,862	15.5	13,311.6
Lake Havasu City	55,429		
Navajo County	114,780	11.5	9,953.2
Show Low	12,315		
Pima County	1,014,023	110.4	9,186.3
Tucson	543,959		
Pinal County	350,558	65.3	5,369.6
Casa Grande	45,116		
Santa Cruz County	47,471	38.4	1,237.6
Nogales	21,709		
Yavapai County	227,348	28.0	8,123.3
Prescott	43.280		
Yuma County	203,779	37.0	5,514.1
Yuma	93,719		
Arizona Total	6,629,455	58.3	113,634.6

Source: U.S. Census Bureau, Census 2000. Arizona Department of Commerce, Population Statistics Unit, December 12, 2008.

4.0 AREAS RECOMMENDED AS NONATTAINMENT

According to EPA's guidance, the default nonattainment area boundary for areas violating the air quality standard or contributing to a violation in a nearby area is the county in which the violating monitor is located. The Hayden area of Gila and Pinal Counties is the only location where ambient air monitors have recorded concentrations of Pb that violate the air quality standard. Most of the Gila County, however, contains vast expanses of undeveloped public lands and isolated rural communities that are not affected by Pb emissions originating from ASARCO's Hayden copper concentrating and smelter operations. The townships in eastern Pinal County recommend as nonattainment are similarly isolated

from growing urban areas in the western and northern portions of the county by publicly owned lands and rugged terrain.

This recommendation addresses the nine factors or criteria outlined in EPA's guidance to determine a more appropriate nonattainment area boundary. What follows is an explanation of how each criterion was addressed in Arizona's determination.

4.1 Air Quality Data

For its determinations, ADEQ reviewed valid ambient Pb monitoring data recorded at three air quality monitors. One monitor is located in central Phoenix and two monitors are located in the Hayden area near the ASARCO Ray Complex copper concentrating and smelting operations.

The JLG Supersite PM_{10} monitor located in central Phoenix is operated as part of the National Air Toxics Trends (NATTS) network representing the Phoenix metropolitan area. The JLG Supersite PM_{10} samplers are operated by ADEQ; the filters are processed by ERG laboratory as part of the NATTS program. ADEQ validates the laboratory results before submitting the data in AQS. The validation procedure verifies that the monitor passed all quality control tests. Monitor operation, sample handling and shipping, and data validation are included in the ADEQ NATTS/ATMP/PAMS[4] Quality Assurance Project Plan (QAPP). The JLG Supersite monitor has not recorded violations of the Pb NAAQS.

The two PM_{10} monitors in Hayden and Winkelman are part of the Remedial Investigation (RI) being conducted by EPA Region IX Superfund; sampling at these monitors began in November 2006 and is scheduled to continue through 2011. Data sets from these monitors are entered in the EPA Air Quality System (AQS) database; Appendix A contains PM_{10} and Pb sample results collected during 2006-2008. These Partisol filter-based monitors are approved by EPA as a federal reference method for Pb.

The Hayden monitoring station is located on the roof of the Town of Hayden maintenance building; the Winkelman monitor is located on the roof of the Hayden High School gymnasium in Winkelman. 24-hour samples were collected every sixth day until March 28, 2008, at which point the frequency was increased to every third day through December 2008. Meteorological data were also collected at these sites, including average ambient temperature, relative humidity, and wind speed and direction. The locations of the Hayden and Winkelman monitors are depicted in Figure 4-1 on Page 8.

The Hayden and Winkelman PM_{10} samplers have been operated by two contractors: CH2M Hill and Innovative Technical Solutions Incorporated (ITSI). CH2M Hill wrote the QAPP, Field Sampling Plan (FSP), and Data Management Plan in November 2005; CH2M Hill commenced air quality sampling in November of 2006 and continued monitoring until ITSI assumed responsibility in March 2009. The QAPP was amended when ITSI was assigned the project by EPA Region 9. ITSI also amended the Field Sampling Plan (FSP) written by CH2M Hill.

The monitor filters were processed by a contract laboratory, Chester LabNet. CH2M Hill performed quality control checks on the monitors per the QAPP and FSP. ADEQ's review of the QAPP documents and quality control checks concluded the lead data provided by the EPA Region IX Superfund Program has experienced at least three levels of validation (sampler field checks and verification of sample validity immediately after collection; laboratory analysis and quality control checks of laboratory procedures; and review by EPA Superfund staff). These procedures are comparable to the procedures followed by ADEQ.

[4] ATMP is an abbreviation for Air Toxics Monitoring Program; PAMS is an abbreviation for Photochemical Assessment Monitoring Station.

ADEQ used data substitution procedures because data completeness for the Hayden and Winkelman monitors was less than 75 percent for several months in the 2006-2008 period. For its substitutions, ADEQ used the lowest concentration recorded in a given month during the three-year period; for example, if a substitution was required in the month of January, ADEQ substituted the lowest concentration recorded among January 2006, January 2007, and January 2008. ADEQ's statistics are included in Appendix A.

Figure 4-1
Hayden Pb Monitor Locations

The Winkelman monitor has not recorded violations of the Pb NAAQS; the Hayden monitor, however, recorded three separate three-month averages in violation of the NAAQS, as shown below in Table 4-1. CH2M Hill prepared a preliminary report on the data collected from November 2007-November 2008 (see Appendix C); the report identified the same three-month averages at the Hayden monitor as being above the Pb standard. This report did not include the full dataset provided by EPA Region IX to ADEQ (October 2006-December 2008, Appendix A). The CH2M Hill report noted that the findings may change once all of the data has been validated and all quality assurance and control procedures (QA/QC) have been completed. An ADEQ memo documenting that all QA/QC procedures for the monitoring data were completed in compliance with EPA guidelines is contained in Appendix D.

Table 4-1
Violations of the Pb NAAQS at the Hayden Monitor

Ending Month of Three-Month Average	Pb Concentrations in $\mu g/m^3$
September 2008	0.17
October 2008	0.19
November 2008	0.21

4.1.1 Design Values

A design value is a statistic that describes the air quality status of a given area relative to the level of the NAAQS. Design values are typically used to classify nonattainment areas, assess progress towards meeting the NAAQS, and for development of control strategies. Design values are expressed as a concentration, thereby allowing a direct comparison to the level of the standard. They are based on multiple years of data, ensuring a stable indicator. The air quality design value for the 2008 Pb NAAQS is defined as the maximum rolling three-month average over a three-year period (i.e., 2006-2008). The level of the 2008 Pb NAAQS is 0.15 micrograms per cubic meter ($\mu g/m^3$) which is not to be exceeded in any three-month period. The design value of the Hayden monitor data is the November 2008 three-month average of 0.21 $\mu g/m^3$.

4.2 Emissions Data (location of sources and contribution to Pb concentrations)

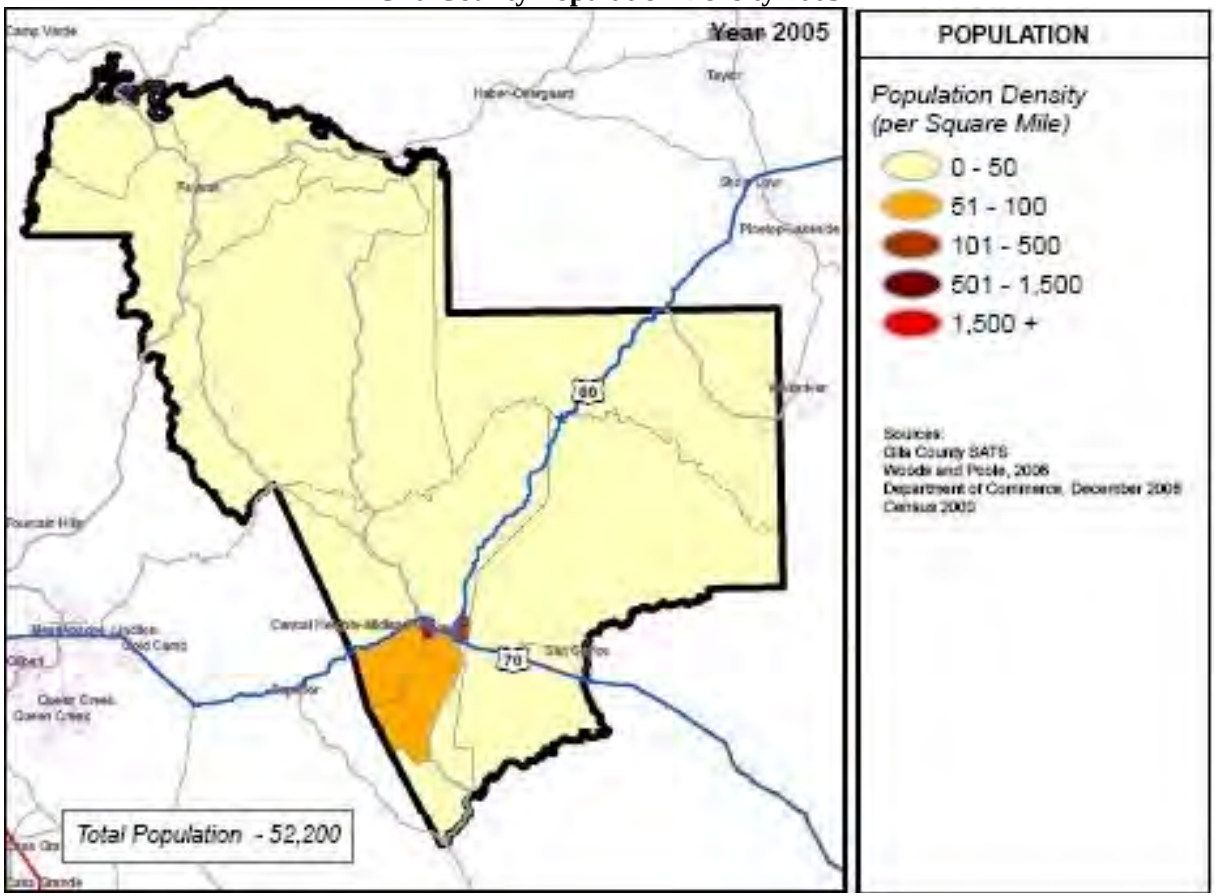
Monitoring data indicates the ASARCO concentrator and smelter are the largest sources of Pb emissions in the area. Extensive chemical analyses of filters from both the Hayden Maintenance Yard and Hayden High School monitors were conducted as part of the EPA study of the Hayden Superfund site. The chemical fingerprint on the filters, combined with analysis of wind speeds and direction indicate that the operations at the ASARCO Ray Complex copper concentrating and smelting operations are the most likely source of the Pb exceedances measured at the Hayden Maintenance Yard monitor. This conclusion is based on high concentrations of sulfur, copper, arsenic, and iron, in addition to Pb, on the same date. As required by the operating permit issued by ADEQ, ASARCO reported compound Pb emissions totaling 4.82 tons in 2008. This figure includes fugitives and stack emissions.

4.3 Population Density and Degree of Urbanization

For these criteria, population density, employment, and land ownership were examined for the proposed Nonattainment Area. These data provide an indicator of the levels of anthropogenic activity that can contribute to Pb emissions and the size of the exposed population. A review of the projections depicted in Figures 4-2 thru 4-6 demonstrates that population density in the proposed Nonattainment Area and the surrounding region is minimal and, according to approved Arizona population estimates, [5] is not projected to change significantly through the potential maintenance period (2011-2031.)

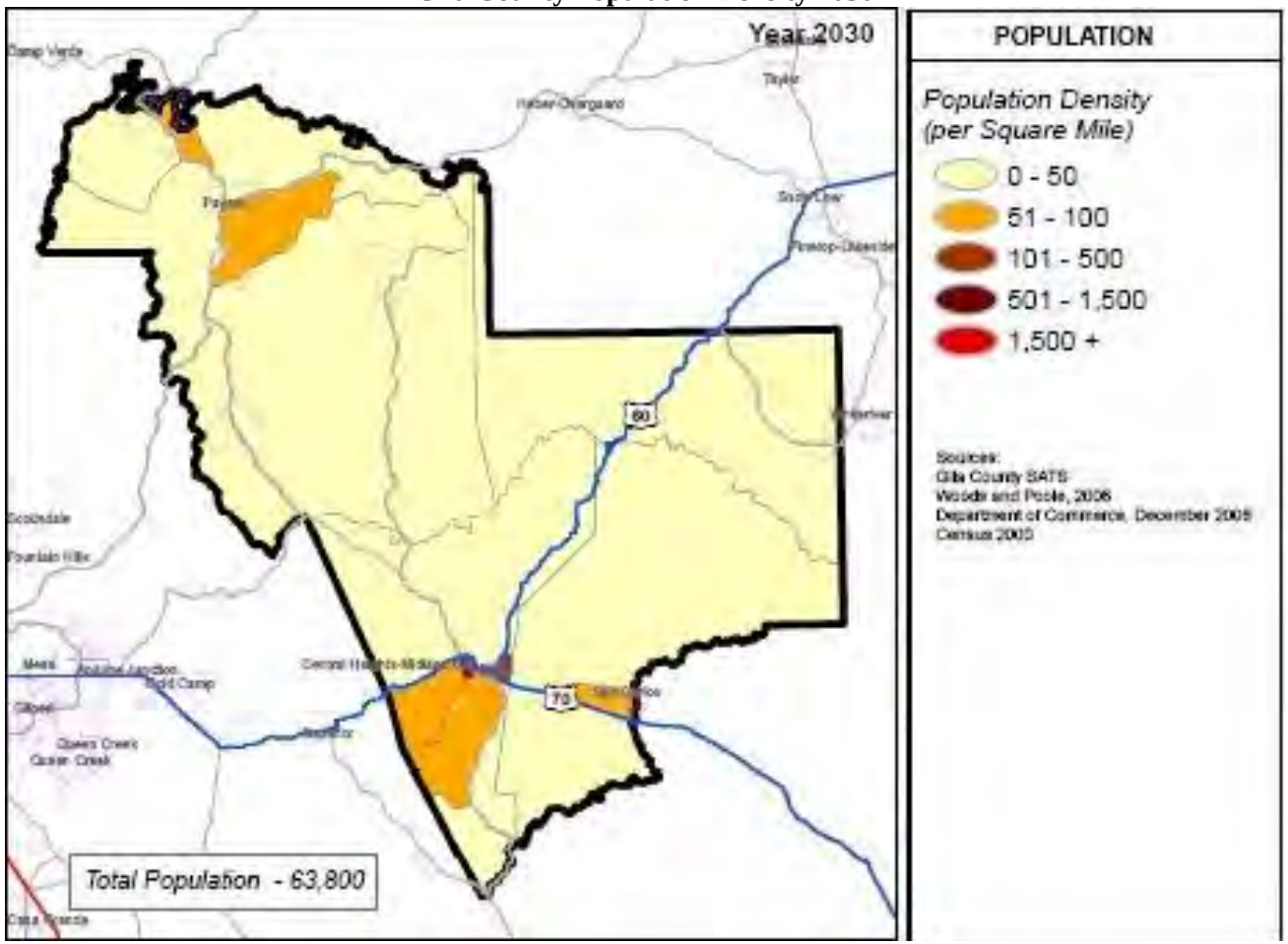
[5] Source: *Building a Quality Arizona*, Arizona Department of Transportation, 2009.

Figure 4-2
Gila County Population Density 2005



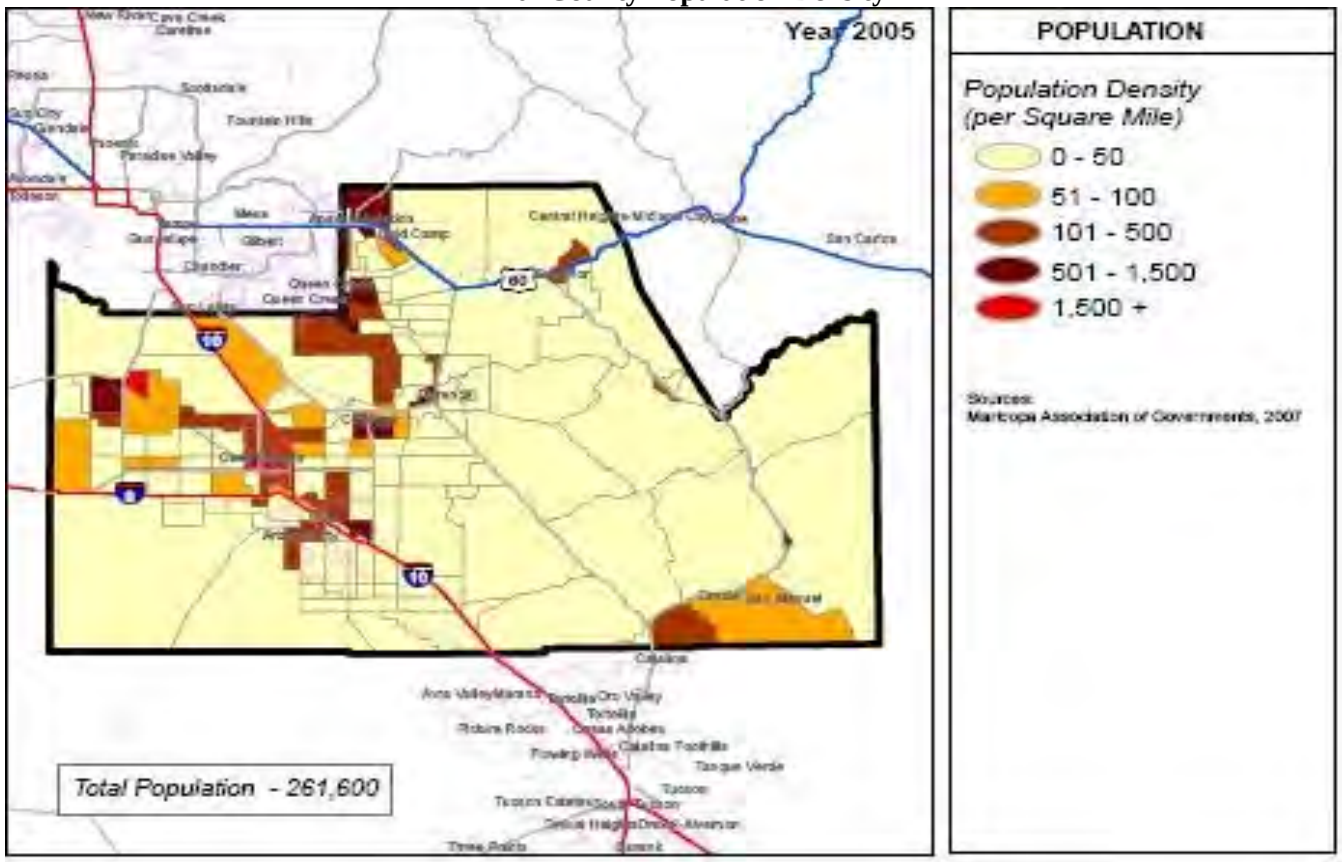
Source: Arizona Department of Transportation (*Building A Quality Arizona*)

Figure 4-3
Gila County Population Density 2030



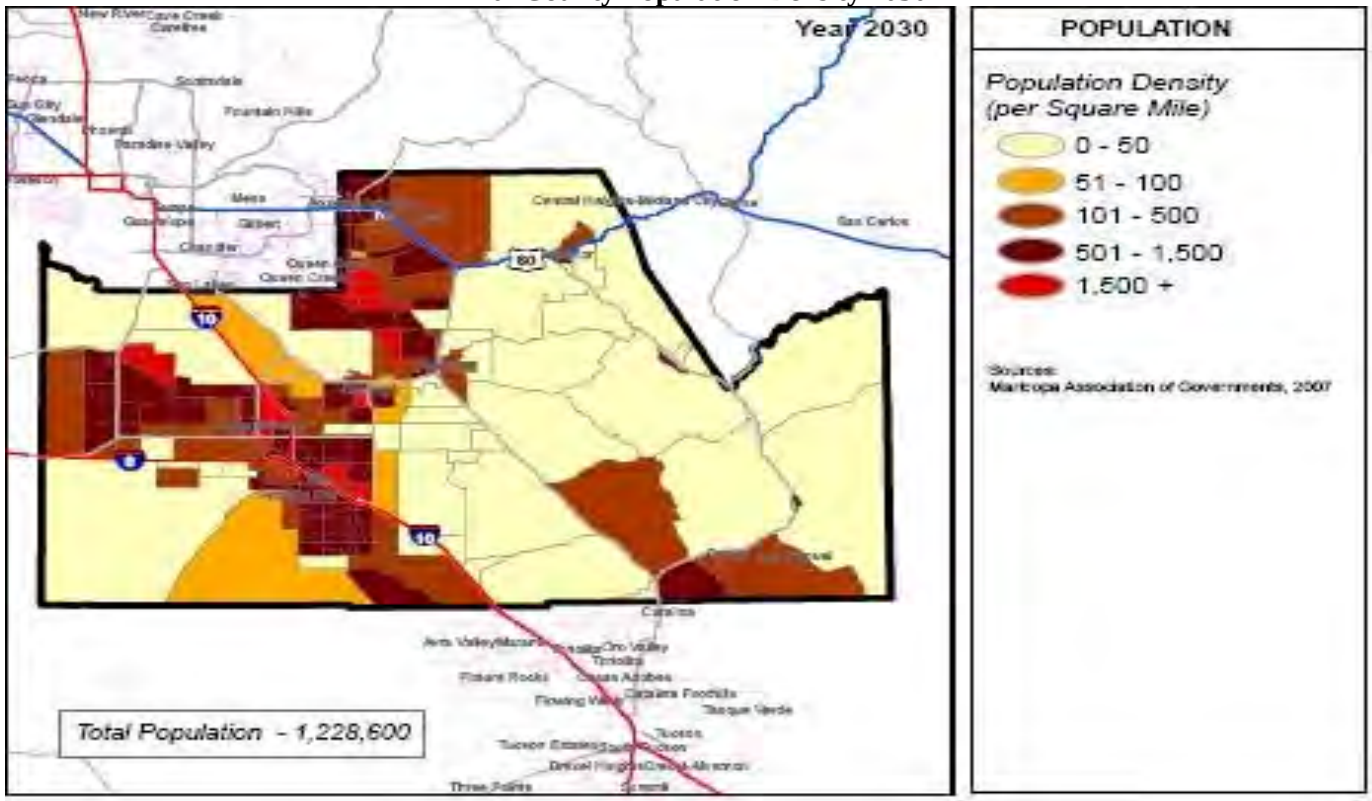
Ibid.

Figure 4.4
Pinal County Population Density



Ibid.

Figure 4-5
Pinal County Population Density 2030

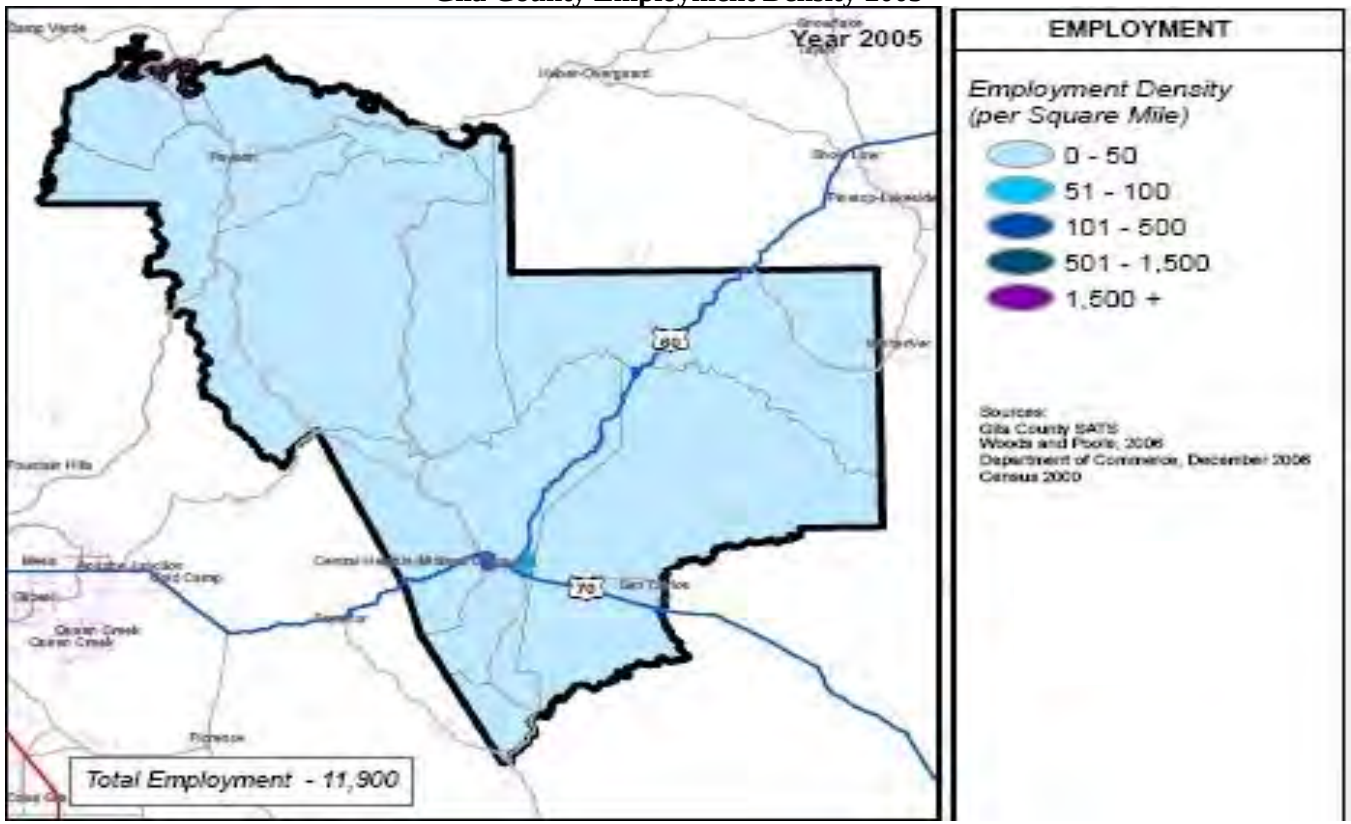


Ibid.

4.4 Traffic and Commuting Patterns

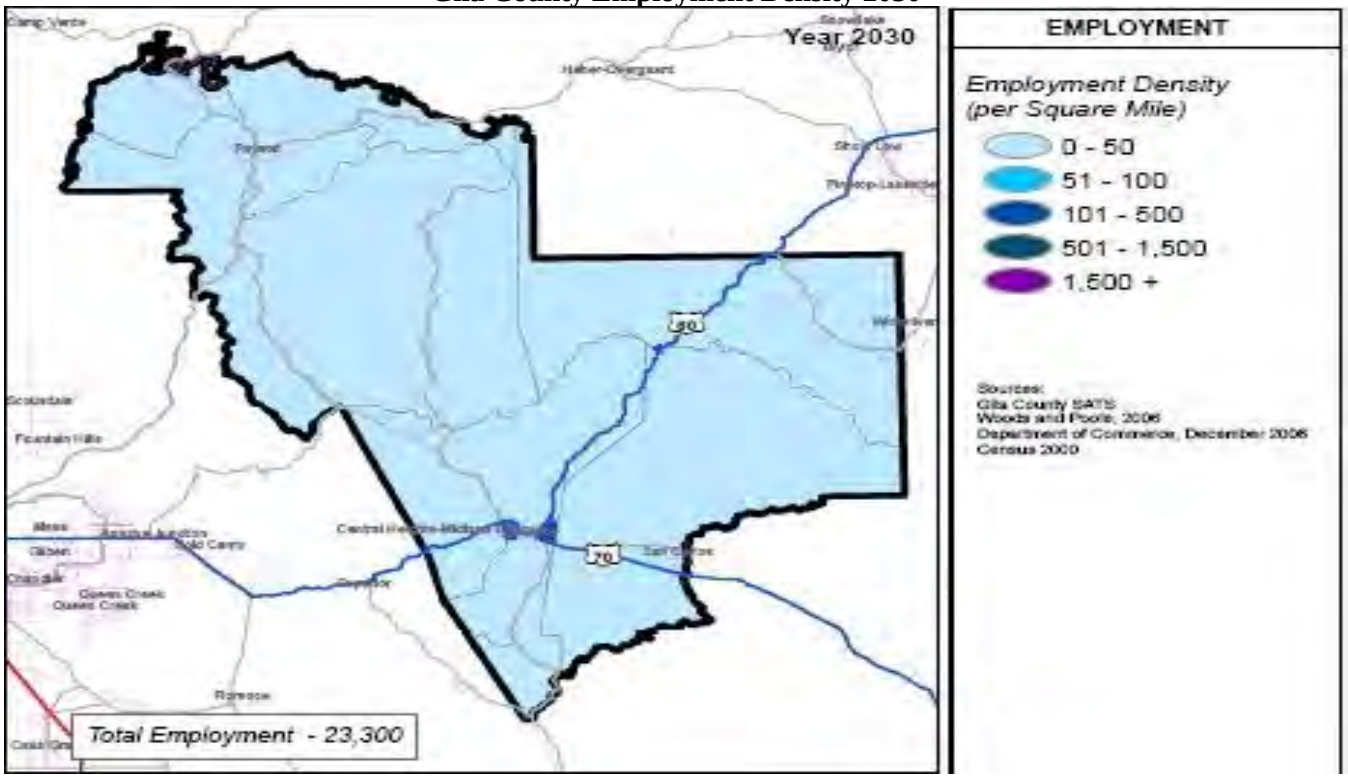
The volume of traffic in the Hayden area is low according to traffic counts conducted by ADOT. The proposed Nonattainment Area includes sections of Highways 177 and 77, arterials with the highest traffic counts in the area (3,036 trips per day). By comparison, traffic counts for Highway 84 in Casa Grande, the largest city in Pinal County, are nearly three times as high (10,562); traffic counts for U.S. 60 in Globe are nearly eight times higher (16,978 trips per day). Figure 4-11 illustrates the annual average daily traffic volume for the Hayden area according to ADOT. Figures 4-7 thru 4-10 illustrate the level of population density in 2005 and projections for 2030. Census Bureau data indicates commuting to and from Gila County for employment purposes is minimal.

Figure 4-6
Gila County Employment Density 2005



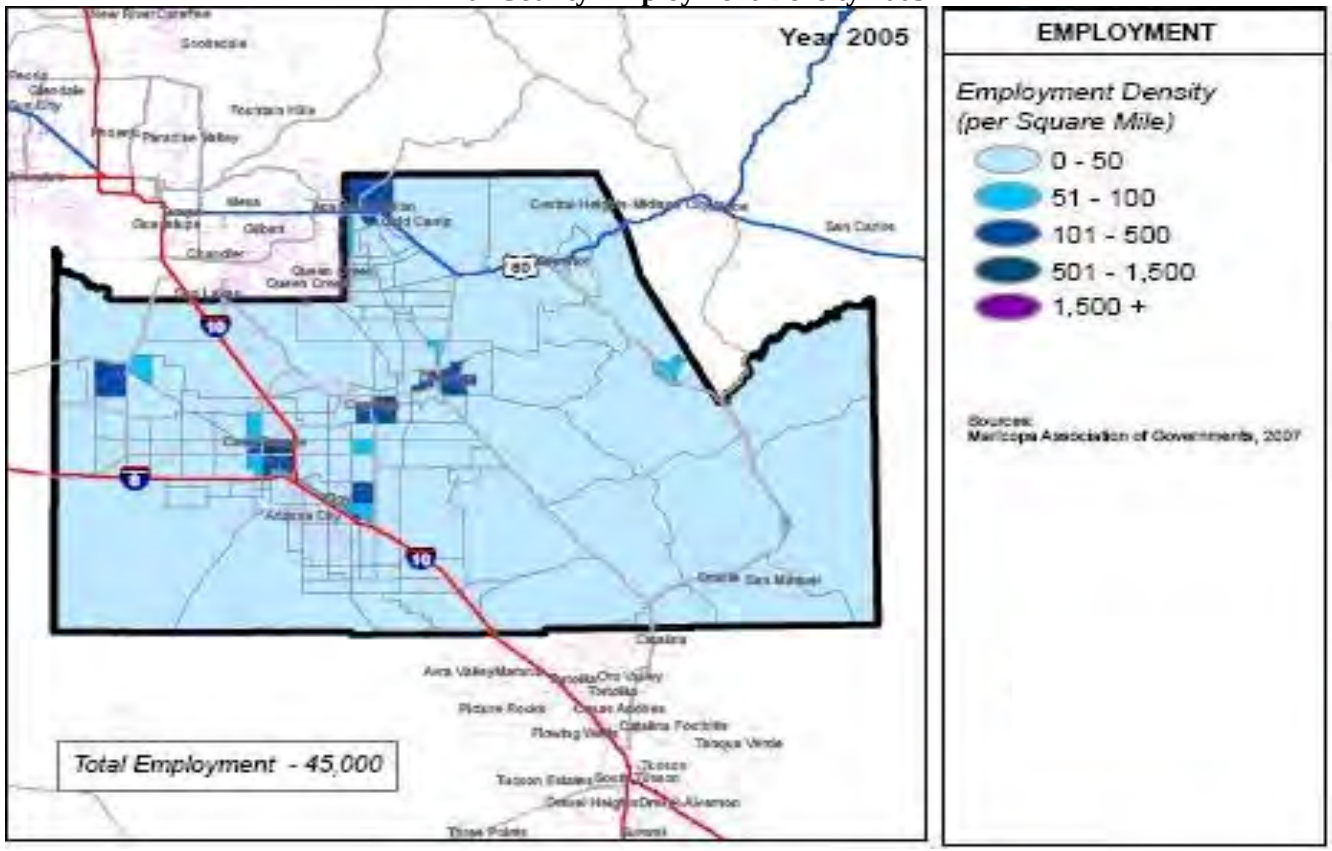
Ibid.

Figure 4-7
Gila County Employment Density 2030



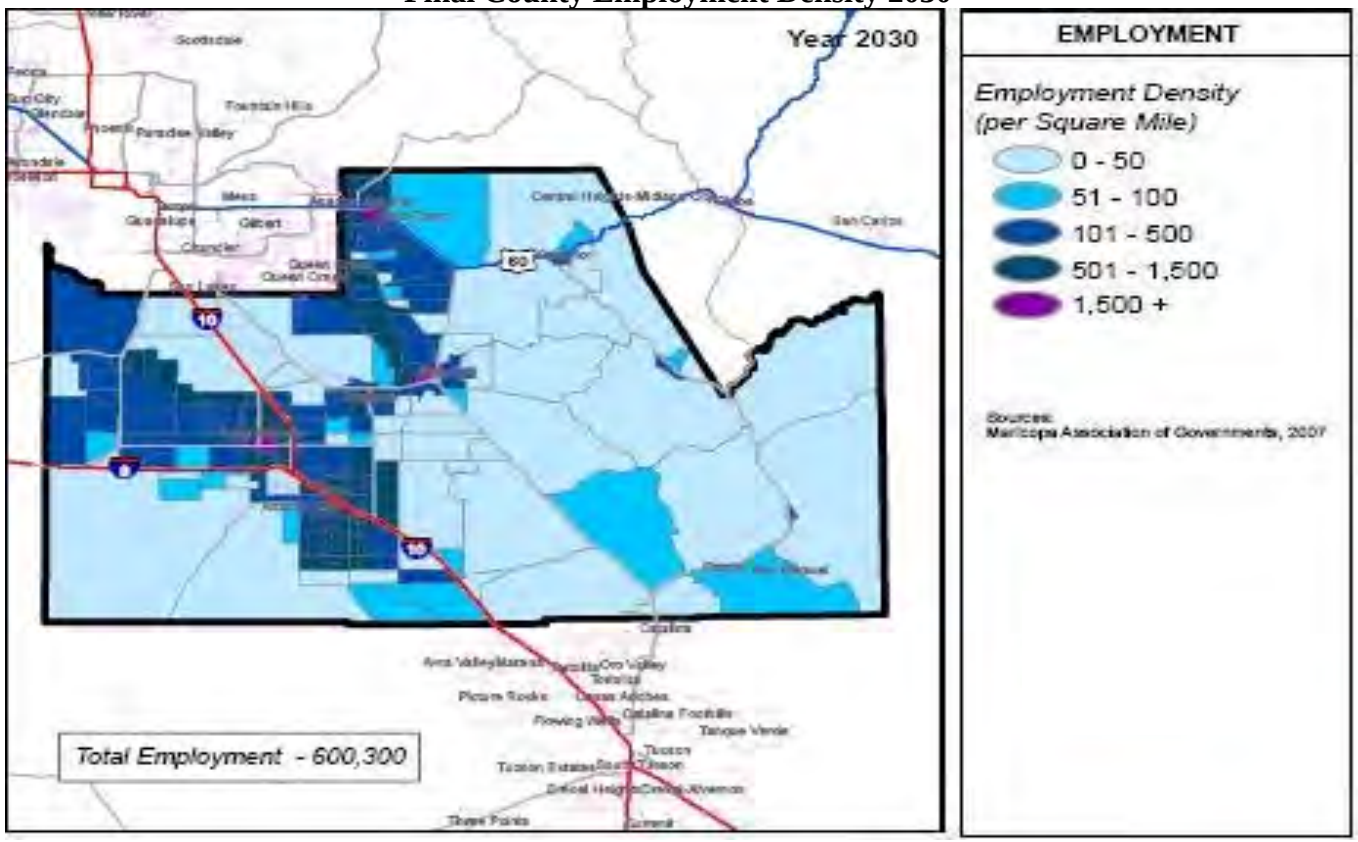
Ibid.

Figure 4-8
Pinal County Employment Density 2005



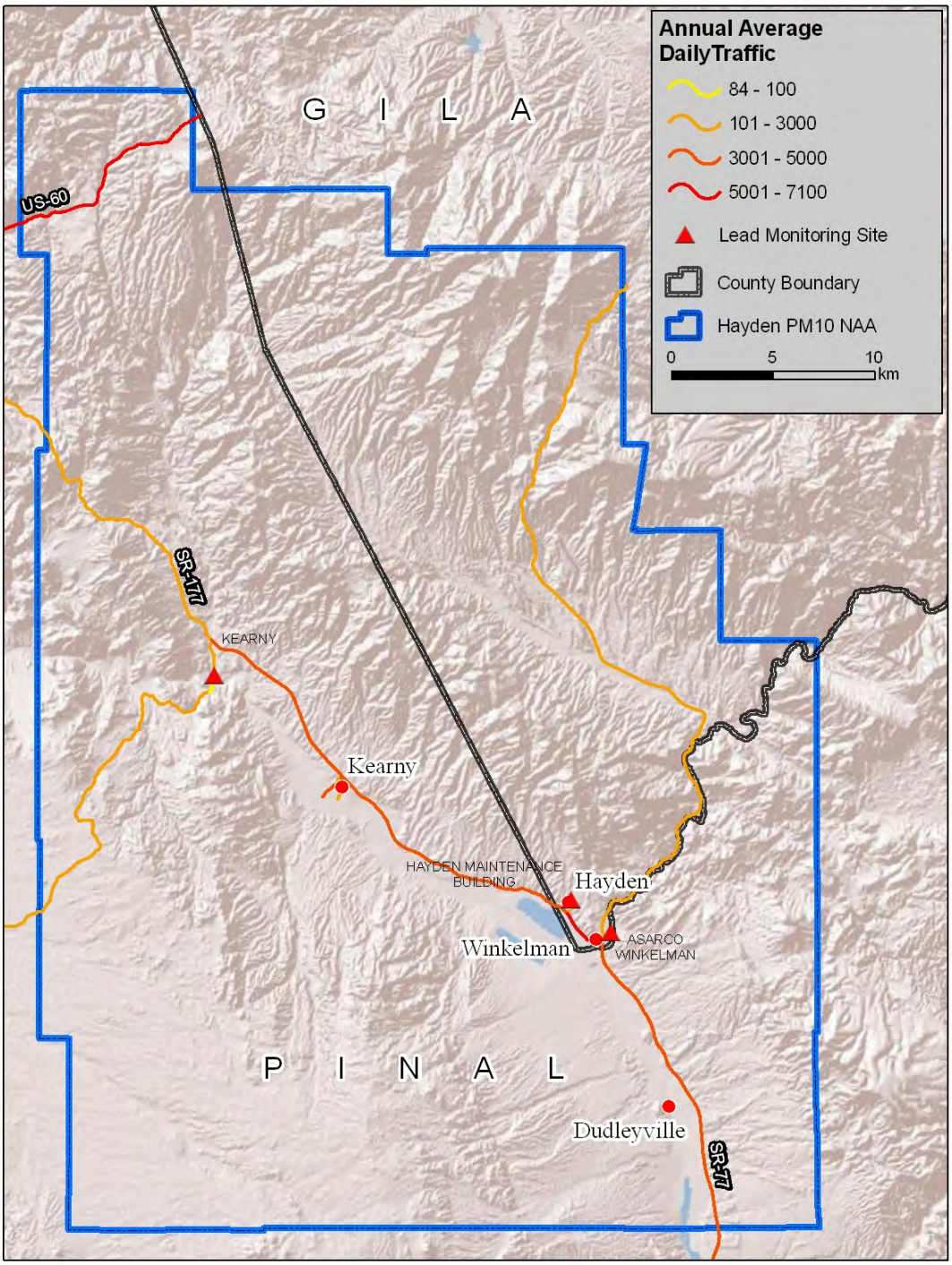
Ibid.

Figure 4-9
Pinal County Employment Density 2030



Ibid.

Figure 4-10
Proposed Pb Nonattainment Area Annual Average Daily Traffic
Source: Arizona Department of Transportation



4.5 Growth Rates and Patterns

Development in Gila and Pinal Counties is defined by patterns of land ownership. The U.S. Forest Service is the largest landholder in Gila County, accounting for 56 percent of the land area. Indian reservations cover 37 percent. The U.S. Bureau of Land Management holds 2 percent; and the State of Arizona and other public lands comprise 2 percent. Individual and corporate ownership accounts for only 4 percent of the county. Figure 4-11 illustrates restrictive land ownership patterns that limit prospects for growth in the proposed Nonattainment Area. Growth in Pinal County is also defined by land ownership. The state owns 35 percent; Tribal lands account for 20 percent; Federally-owned lands account for 18 percent; other public lands comprise 1 percent. Individual and corporate ownership accounts for 26 percent. Growth generally occurs in the north central portion of the County in areas contiguous with the Phoenix-Mesa-Scottsdale metropolitan area; Indian reservations as well as state and federal lands create barriers to contiguous expansion of the urbanized core. Additional growth follows the I-10 and I-8 corridors, south of the Gila River and Ak-Chin Indian Reservations.

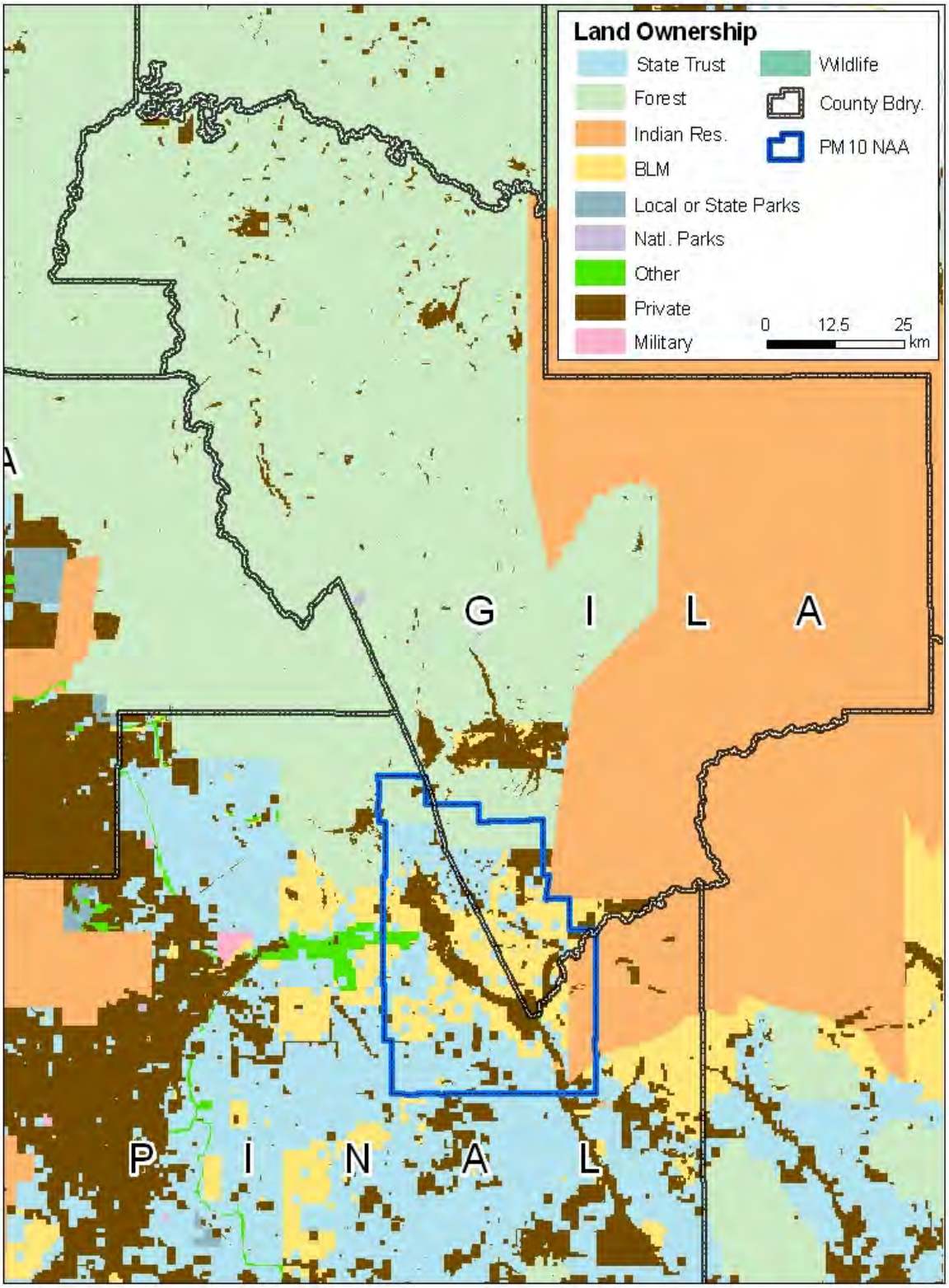
The rate of growth in the Hayden area has been stagnant over recent decades. Though population of both Gila and Pinal Counties is projected to grow significantly, the Hayden area is not. As shown in Table 4-2 below, growth in the area is projected to remain flat through the potential maintenance period (2011-2031).

Table 4-2
Historical and Projected Population for Gila and Pinal Counties

	1990	2000	2008	2015	2031
Pinal County	179,727	116,397	316,899	486,363	876,091
Gila County	40,216	51,335	56,427	61,128	70,358
Globe	6,062	7,486	7,603	7,974	8,647
Miami	2,018	1,936	1,973	2,022	2,104
Kearny	2,262	2,449	2,085	2,630	3,774
Winkelman	676	443	430	430	430
Hayden	909	892	860	860	860

Sources: Historical data – U.S. Census Bureau; Projections – Arizona Department of Commerce.

Figure 4-11
Land Ownership in Gila and Pinal Counties



4.6 Meteorology

Synoptic scale air flows and local topographically driven surface winds influence the speed and direction of particulate matter transport throughout the Hayden area. Because the atmosphere within an airshed acts in a cohesive way with respect to the dispersion of emissions, local wind patterns and flow are most influential in affecting the impact of local particulate emissions. Local wind patterns in the Gila River Airshed are greatly influenced by the complex local topography. Hayden is located at the junction of two rivers, the Gila and the San Pedro. Situated in a low-lying part of a valley with mountains reaching over 4,000 feet to the north, east and southwest, Hayden is subject to a distinct mountain-valley diurnal wind pattern. Under stable atmospheric conditions, nighttime winds are typically from the southeast with speeds less than ten miles per hour. These conditions cause air pooling in low-lying areas at night, causing pollutants within the air to settle in these areas. The up-slope air flows and convection that occurs during the day increases dispersion and flow out of the Hayden area. Under normal daytime conditions, surface winds in the Hayden area range from west-southwesterly to west-northwesterly as the atmosphere becomes less stable. This pattern is repeated throughout the complex terrain found in the Hayden area.

During the wintertime, relatively strong inversions (where cold air becomes trapped at the surface by warmer air aloft) create extremely stable atmospheric conditions. Depending on the strength of the inversion and amount of daytime surface heating, the inversion may break by the early afternoon, permitting the air to mix vertically. Sometimes, however, the inversion may not break at all. Under these conditions, vertical and horizontal movement of the air is very limited, causing pollutants in the air to accumulate up to several days with little dispersion.

4.7 Geography/Topography

Hayden lies in the Gila River Valley, approximately 2,044 feet above sea level. The town sits at the base of the Dripping Springs Mountains which rise to a height of approximately 5,096 feet. The Mescal and Pinal Mountain ranges rise to the east beyond the Dripping Springs range to approximately 7,848 feet in elevation at the highest point. To the west of Hayden, the Tortilla Mountains rise to a height of 4,273 feet. The complex terrain forms natural boundaries that isolate the Hayden area from most of Gila and Pinal Counties. As shown in Figure 4-1 (Page 7), a small range of foothills forms a barrier between Hayden and Winkelman, which may reduce the impact of emissions from the operations in Hayden.

4.8 Jurisdictional Boundaries

The boundaries recommended by ADEQ for the Pb Nonattainment Area are the same as the existing Hayden SO_2 Nonattainment Area. Although the proposed Nonattainment Area occupies townships in both Pinal and Gila Counties, the area is under ADEQ's jurisdiction and therefore does not pose jurisdictional conflicts. As the state has no jurisdiction within the interior boundaries of Indian reservations, the recommended Nonattainment Area excludes all of Indian Country.

4.9 Level of Control of Emission Sources

In its analysis ADEQ considered existing control measure applicability areas. In general, emissions control programs are implemented at point sources and in areas with violations of the NAAQS. For example, the existing Hayden PM_{10} and SO_2 Nonattainment Areas require numerous pollution control measures to address air pollution in the Hayden area. Appendix D contains a complete list of control measures and technologies required by the operating permit issued by ADEQ for the ASARCO smelter and concentrator. The list also includes several existing federally enforceable control measures that were included in the Hayden PM_{10} Nonattainment Area SIP submitted to EPA in September 1989 and the

Hayden SO_2 Nonattainment Area SIP submitted to EPA in July 2002. As the forthcoming Pb SIP is developed, the status and scope of implementation for each control measure will be reviewed.

4.10 Nonattainment Area Summary of Criteria Analysis

ADEQ reviewed the nine criteria outlined in EPA's guidance and determined that portions of Gila and Pinal Counties meet the criteria for inclusion in a Pb Nonattainment Area. The recommended area includes townships in the existing PM_{10} and SO_2 planning areas. Because the most likely source of the high Pb concentrations is the copper concentrating and smelting operations at the ASARCO Ray Complex, this area represent the de facto impact area of that facility. Table 4-3 summarizes the data and information supporting the Nonattainment Area recommendation.

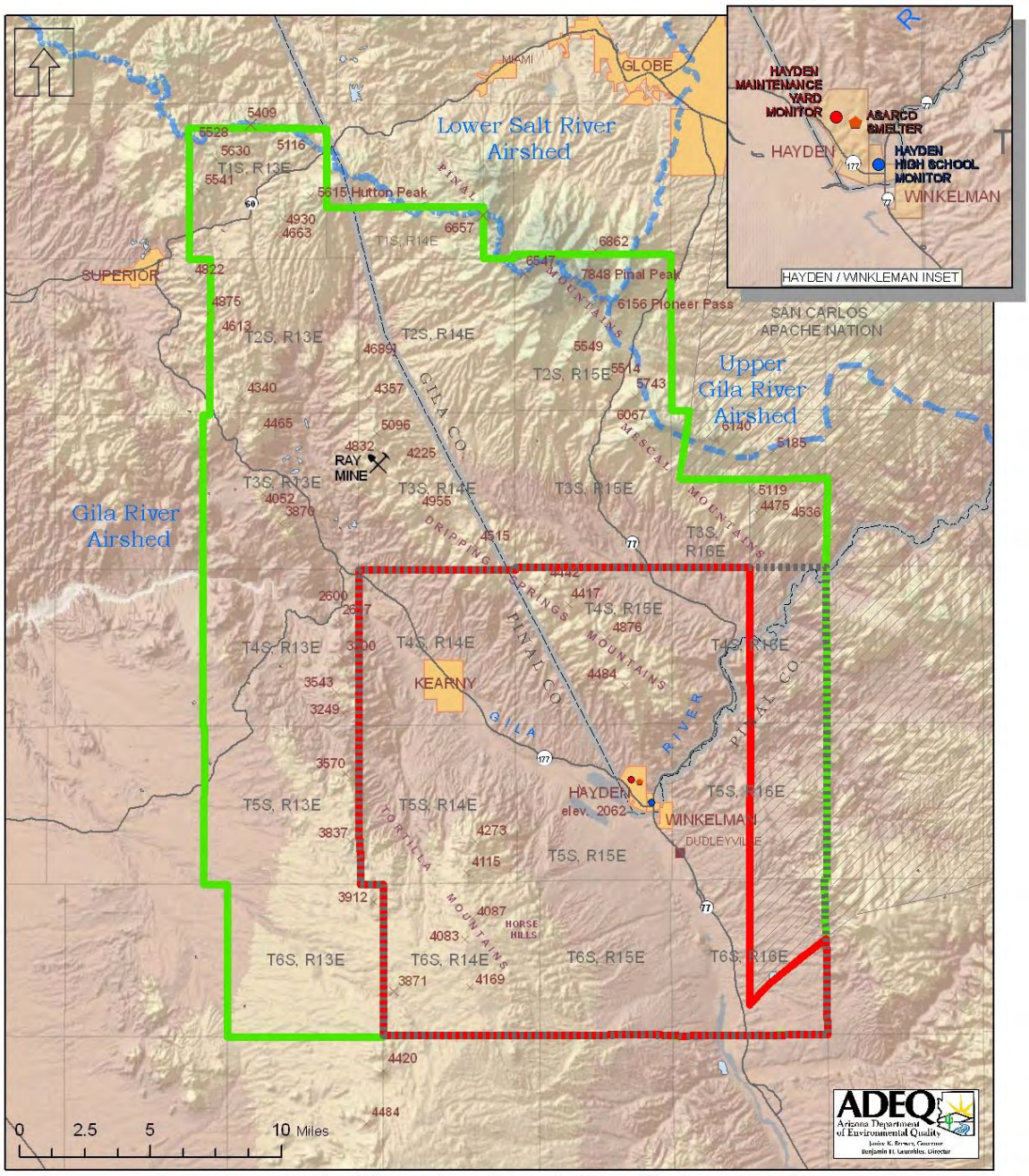
Table 4-3 Summary of Nine Criteria Analysis for the Proposed Hayden Pb Nonattainment Area		
Criteria	**Factors Supporting the Recommended Nonattainment Area Boundary**	**Factors Supporting the Exclusion of Portions of Gila and Pinal Counties**
Air Quality Data	The proposed Nonattainment Area includes the location of the Hayden Maintenance Building monitor that recorded three Pb concentrations exceeding the NAAQS.	Monitoring data collected in Miami is indeterminate; therefore ADEQ is recommending the Miami area be designated as attainment/unclassifiable.
Emissions Data	Emissions data confirm the Hayden ASARCO smelter and concentrator is the largest source of Pb emissions in the proposed Nonattainment Area.	The two significant stationary sources of Pb emissions in Gila County are the Miami and Hayden smelters and concentrators. The recommended Nonattainment Area is identical to the existing Hayden SO_2 Nonattainment Area.
Population Density and Degree of Urbanization	The area recommended for nonattainment is in one of the least populated and undeveloped regions of the state.	Gila County has very low population and employment densities. The highest density levels follow areas of private land ownership; however, less than 4 percent of Gila County is under private ownership. Private ownership in Pinal County totals 26 percent; however, the eastern regions of the county near Hayden are predominantly publicly owned and limit further development.
Traffic and Commuting Patterns	The proposed Nonattainment Area includes Highways 177 and 77, arterials with the highest traffic counts in the area.	Census data indicates the number of Gila County residents commuting to Maricopa, Pima, or Pinal Counties account for less than 10 percent of those who commute to work within Gila County. In addition, since the introduction of unleaded gasoline, traffic is no longer a significant source of Pb emissions.
Growth Rates and Patterns	Significant growth is not projected in the Hayden area during the potential mainteance period (2011-2031).	Due to constrained land use patterns, both Gila and Pinal Counties have a low potential for growth.
Meteorology	The recommended Nonattainment Area includes a portion of the Gila River Airshed where the ASARCO Ray Complex is located.	The regions of Gila and Pinal Counties that are not in the Gila River Airshed are not impacted by emissions from the ASARCO Ray Complex.
Geography/ Topography	The proposed Nonattainment Area includes portions of the Gila River Airshed where Pb emissions originating from the ASARCO smelter and concentrator are likely to be dispersed.	The complex mountainous terrain surrounding the Hayden area prevents Pb emissions originating in Hayden from affecting other regions of Gila and Pinal Counties.
Jurisdictional Boundaries	The recommended Nonattainment Area is continuous with the Hayden SO_2 Nonattainment Area, excluding that portion within the San Carlos Indian Reservation. The recommendation requires no new institutional arrangements for accomplishing required tasks. Although the proposed Nonattainment Area includes townships in Pinal and Gila Counties, the area is also under the State's jurisdiction.	The portions of Gila and Pinal Counties recommended as attainment/unclassifiable designation either lack significant emission sources or, in the case of the Miami area, Pb monitoring data was indeterminate. Inclusion of these areas would not help bring the Hayden area into attainment.
Level of Control of Emission Sources	The existing Hayden PM_{10} and SO_2 Nonattainment Area SIPs require control measures to address nonattainment with the NAAQS. In addition, the operating permit for the ASARCO smelter and concentrator contains requirements designed to mitigate particulate emissions, including Pb .	Under the terms of the operating permit issued by ADEQ for the ASARCO smelter and concentrator, ADEQ has the authority to require the implementation of control measures and technologies necessary to achieve attainment of the NAAQS in the recommended Nonattainment Area.

5.0 AREA DESIGNATION RECOMMENDATIONS

ADEQ demonstrated in the preceding analysis that most of Arizona should be designated as attainment/unclassifiable based on the criteria established by EPA in the 2008 Pb final rule. ADEQ considered comments made by Zephyr Environmental Corporation on behalf of ASARCO (see Appendix F) and by the Town of Kearny (see Appendix H) prior to making final boundary determinations (for ADEQ's response to Zephyr's comments, see Appendix G). The proposed Hayden Pb Nonattainment Area encompasses all or part of the following 9 townships. Those sections of Gila and Pinal Counties not listed below are recommended as attainment/unclassifiable. The state's proposed Pb Nonattainment Area is illustrated in Figure 5-1.

T4S, R14E;
T4S, R15E;
T4S, R16E (except that portion in the San Carlos Indian Reservation);
T5S, R14E;
T5S, R15E;
T5S, R16E (except that portion in the San Carlos Indian Reservation);
T6S, R14E;
T6S, R15E;
T6S, R16E (except that portion in the San Carlos Indian Reservation);

Figure 5-1
Proposed Hayden Pb Nonattainment Area



Recommended Hayden Lead Nonattainment Area

- Hayden Maint Yard Monitor
- Hayden High School Monitor
- ASARCO Smelter
- Mountain Peak
- Recommended Lead Non Attainment Area
- Cities
- Hayden PM10 Non Attainment Area
- Airshed
- Hayden SO2 Nonattainment Area
- Cities
- Native American Lands
- County
- Township/Range

August 20, 2009 - Author N. Caroli

Appendix A
Ambient Monitoring Data

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Pb-PM_{10} - Standard Conditions 3-Year Summary Statistics								
Hayden - Maintenance Building AQS# 04-007-8020 AAAD# 137412								
Year	Month	No. of Possible Samples	No. of Creditable Samples	Monthly Data Capture (%)	No. of Extra Samples	Monthly Average Lead ($\mu g/m^3$)	3-Month Data Capture (%)	3-Month Average Lead ($\mu g/m^3$)
2006-2008 COMPLIANCE VALUES								
2006	October *	2	0	0	0	0	0	0.00
	November *	5	4	80	1	0.1394	27	0.07
	December #	5	2	40	0	0.0865	40	invalid
2007	January #	5	4	80	0	0.1248	67	invalid
	February ^	5	5	100	0	0.0158	73	invalid
	March	5	4	80	0	0.0715	87	0.07
	April	5	3	60	0	0.0240	80	0.04
	May ^	5	4	80	0	0.0348	73	invalid
	June	5	5	100	0	0.0262	80	0.03
	July	6	5	83	0	0.0380	88	0.03
	August	5	5	100	0	0.1234	94	0.06
	September	5	5	100	0	0.1950	94	0.12
	October	5	4	80	1	0.1214	93	0.15
	November	5	5	100	0	0.0874	93	0.13
	December #	6	2	33	0	0.1525	71	invalid
2008	January #	5	2	40	0	0.1045	58	invalid
	February ^	5	3	60	0	0.0377	44	invalid
	March ^	5	4	80	0	0.0400	60	invalid
	April ^	5	4	80	2	0.1193	73	invalid
	May	5	5	100	2	0.0756	87	0.08
	June	5	3	60	4	0.0714	80	0.09
	July	5	5	100	3	0.0653	80	0.07
	August ^	5	3	60	4	0.1560	73	invalid
	September	5	4	80	0	0.2880	80	**0.17**
	October ^^	5	4	80	1	0.1162	73	**0.19**
	November ^^	5	3	60	3	0.2325	73	**0.21**
	December #	5	4	80	1	0.0682	73	invalid

Invalid 3-month average due to data capture

Invalid 3-month average due to data capture and insufficient number of samples.

^ Data Capture <75% and does not pass the above NAAQS test, so this is not a valid 3-month average.

^^ Data Capture <75% and passes the above NAAQS test and 3-month average is valid.

Data Capture <75% and number of samples for month in the design value period is insufficient thus substitution/above NAAQS test not done and 3-month average invalid.

BOLD values denote an exceedance of the NAAQS.

Pb-PM_{10} - Standard Conditions 3-Year Summary Statistics								
Winkelman - Hayden High School Gym AQS# 04-007-8021 AAAD# 137422								
Year	Month	No. of Possible Samples	No. of Creditable Samples	Monthly Data Capture (%)	No. of Extra Samples	Monthly Average Lead ($\mu g/m^3$)	3-Month Data Capture (%)	3-Month Average Lead ($\mu g/m^3$)
2006-2008 COMPLIANCE VALUES								
2006	November *	2	1	50	0	0.0110	17	0.01
	December *	5	3	60	0	0.0240	37	0.02
2007	January #	5	4	80	0	0.0095	63	invalid
	February	5	5	100	0	0.0224	80	0.02
	March	5	5	100	0	0.0202	93	0.02
	April	5	4	80	0	0.0208	93	0.02
	May	5	4	80	0	0.0478	87	0.03
	June	5	5	100	0	0.0508	87	0.04
	July	6	5	83	0	0.0224	88	0.04
	August	5	3	60	0	0.0287	81	0.03
	September ^	5	3	60	0	0.0247	68	invalid
	October ^	5	3	60	0	0.0157	60	invalid
	November ^	5	1	20	0	0.0190	47	invalid
	December #	6	0	0	0	0	27	invalid
2008	January #	5	1	20	0	0.2060	13	invalid
	February ^	5	2	40	0	0.0165	20	invalid
	March #	5	1	20	0	0.0040	51	invalid
	April #	5	0	0	0	0	20	invalid
	May ^	5	4	80	1	0.0410	33	invalid
	June ^	5	5	100	3	0.0303	60	invalid
	July	5	5	100	3	0.0228	93	0.03
	August #	5	1	20	1	0.0320	73	invalid
	September ^	5	4	80	2	0.0128	67	invalid
	October ^	5	5	100	3	0.0305	50	invalid
	November	6	4	67	4	0.0295	80	0.01
	December	5	3	60	2	0.0234	76	0.03

Invalid 3-month average due to data capture

Invalid 3-month average due to data capture and insufficient number of samples.

* November and December 2006 are not complete as there are no data for the rest of 2006 (mainly September and October 2006) and will not be "tested".

^ Data Capture <75% and does not pass the above NAAQS test, so this is not a valid 3-month average.

Data Capture <75% and number of samples for month in the design value period is insufficient thus substitution/above NAAQS test not done and 3-month average invalid.

Hayden PM_{10} Data in µg/m^3				
Sample Date	PM_{10}		Pb	
	Result	Qualifier	Result	Qualifier
2006				
10/22/06	0.84		0.0024	*
11/03/06	38.98		0.0266	
11/09/06	37.9		0.0141	
11/11/06	30.62		0.044	
11/21/06	51.53		0.5947	
11/27/06	31.58		0.0191	
12/03/06	48.2		0.1595	
12/09/06	36.71			
12/21/06	0.46		0.0027	*
12/27/06	15.01		0.0143	
Average	29.183		0.0897	
2007				
01/08/07	39.67		0.47	
01/14/07	16.56		0.0167	
01/20/07	12.1		0.0043	
01/26/07	17.36		0.0099	
02/01/07	9.81		0.005	
02/07/07	33.2		0.0103	
02/13/07	18.55		0.037	
02/19/07	27.46		0.0173	
02/25/07	8.64		0.0105	
03/03/07	49.49		0.1444	
03/09/07	R	R	R	R
03/15/07	37.48		0.032	
03/21/07	67.75		0.0885	
03/27/07	54.27		0.0227	
04/02/07	30.53		0.028	
04/20/07	63.06		0.0122	
04/26/07	34.02		0.0324	
05/02/07	R	R	R	R
05/08/07	32.23		0.0774	
05/14/07	45.75		0.0257	
05/20/07	50.34		0.0127	
05/26/07	50.73		0.0253	
06/01/07	91.48		0.046	
06/07/07	51.99		0.0048	
06/13/07	51.31		0.0238	
06/19/07	57.51		0.0298	
06/25/07	47.9		0.0299	
07/01/07	69.08		0.0382	
07/07/07	R	R	R	R
07/13/07	35.27		0.021	
07/19/07	46.16		0.0986	

Winkelman PM_{10} Data in µg/m^3				
Sample Date	PM_{10}		Pb	
	Result	Qualifier	Result	Qualifier
2006				
11/21/06	18.25		0.0033	*
11/27/06	10.39		0.0114	
12/03/06	6.63		0.0027	*
12/09/06	8.21		0.003	*
12/15/06	12.39		0.0261	
12/21/06	11.88		0.0195	
12/27/06	15.66		0.0275	
Average	11.916		0.0134	
2007				
01/02/07	11.38		0.0153	
01/08/07	4.37		0.0027	*
01/14/07	10.88		0.0109	
01/20/07	6.01		0.0050	
01/26/07	7.29		0.0085	
02/01/07	6.45		0.0051	
02/07/07	8.82		0.0140	
02/13/07	11.02		0.0329	
02/19/07	22.70		0.0525	
02/25/07	8.60		0.0097	
03/03/07	7.25		0.0030	
03/09/07	15.99		0.0178	
03/15/07	17.69		0.0185	
03/21/07	25.40		0.0514	
03/27/07	82.41		0.0121	
04/02/07	15.56		0.0170	
04/08/07	43.09		0.0143	
04/14/07	12.99		0.0027	*
04/20/07	35.27		0.0050	
04/26/07	22.62		0.0479	
05/02/07		R	R	R
05/08/07	31.15		0.0798	
05/14/07	28.32		0.0699	
05/20/07	23.01		0.0117	
05/26/07	27.58		0.0325	
06/01/07	28.91		0.0724	
06/07/07	42.83		0.0153	
06/13/07	21.33		0.0276	
06/19/07	29.25		0.0573	
06/25/07	26.37		0.0830	
07/01/07	24.90		0.0465	
07/07/07	17.90		0.0076	
07/13/07	27.11		0.0256	
07/19/07	27.28		0.0266	

Hayden PM_{10} Data in µg/m^3				
Sample Date	PM_{10}		Pb	
	Result	Qualifier	Result	Qualifier
07/25/07	25.2		0.0136	
07/31/07	19.49		0.0208	
08/06/07	9.78		0.0142	
08/12/07	39.68		0.0268	
08/18/07	45.27		0.0429	
08/24/07	32.48		0.0182	
08/30/07	39.05		0.517	
09/05/07	48.19		0.0294	
09/11/07	44.89		0.8362	
09/17/07	45.13		0.0803	
09/23/07	17.65		0.0033	
09/29/07	43.35		0.0273	
10/05/07	24.62		0.0035	
10/11/07	32.19		0.046	
10/17/07	59.08		0.0194	
10/22/07	54.57		0.5156	
10/27/07	34.06		0.0242	
11/01/07	32.98		0.0202	
11/07/07	69.12		0.3183	
11/13/07	53.97		0.0049	
11/19/07	55.97		0.042	
11/25/07	28.99		0.0538	
12/07/07	13.13		0.2119	
12/13/07	23.6		0.0944	
Average	39.27		0.0838	
2008				
01/12/08	25.89		0.1487	
01/18/08	18.26		0.0613	
02/17/08	11.11		0.0291	
02/23/08	8.32		0.0081	
02/29/08	19.6		0.0764	
03/06/08	13.64		0.0697	
03/12/08	R		R	R
03/14/08	37.8		0.064	
03/20/08	29.53		0.0152	
03/26/08	28.67		0.0125	
03/30/08	1.16		0.0024	*
04/05/08	29.05		0.0305	
04/12/08	29.12		0.4627	
04/15/08	33.35		0.059	
04/18/08	44.78		0.1272	
04/21/08	26.71		0.0299	
04/24/08	24.15		0.0097	
05/10/08	56.63		0.022	
05/13/08	40.06		0.1163	
05/16/08	23.85		0.288	

Winkelman PM_{10} Data in µg/m^3				
Sample Date	PM_{10}		Pb	
	Result	Qualifier	Result	Qualifier
07/25/07	16.22		0.0080	
08/06/07	1.53		0.0024	*
08/12/07	12.47		0.0272	
08/18/07	21.93		0.0342	
08/24/07	21.81		0.0257	
08/30/07	8.36		0.0024	*
09/05/07	25.12		0.0177	
09/11/07	6.68		0.0024	*
09/17/07	35.27		0.003	*
09/23/07	16.16		0.0146	
09/29/07	24.66		0.0438	
10/05/07	17.34		0.0040	
10/17/07	44.04		0.0255	
10/27/07	14.24		0.0186	
11/01/07	30.86		0.0196	
Average	21.43		0.0240	
2008				
01/12/08	17.61		0.2067	
02/17/08	10.44		0.0181	
02/23/08	9.8		0.0155	
03/28/08	2.19		0.0024	*
03/31/08	12.47		0.0044	
05/16/08	17.8		0.0101	

Hayden PM_{10} Data in µg/m^3				
Sample Date	PM_{10}		Pb	
	Result	Qualifier	Result	Qualifier
05/19/08	32.67		0.0236	
05/22/08	93.75		0.0166	
05/28/08	24.63		0.0361	
05/31/08	30		0.028	
06/03/08	33.15		0.0547	
06/06/08	17.26		0.0185	
06/09/08	34.74		0.0843	
06/12/08	53.37		0.0746	
06/15/08	60.94		0.1255	
06/18/08	40.22		0.033	
06/21/08	60.24		0.1123	
07/09/08	28.62		0.3432	
07/12/08	12.91		0.0062	
07/15/08	24.81		0.0191	
07/18/08	32.8		0.047	
07/21/08	11.37		0.0205	
07/24/08	18.32		0.0731	
07/27/08	25.49		0.0011	
07/30/08	23.55		0.0132	
08/02/08	24.29		0.0347	
08/05/08	32.16		0.1629	
08/08/08	40.84		0.457	
08/11/08	35.79		0.0417	
08/14/08	15.99		0.1646	
08/17/08	23.43		0.1981	
08/20/08	32.1		0.0363	
09/12/08	40.7		0.0136	
09/18/08	29.01		0.0462	
09/24/08	34.77		0.1263	
09/30/08	56.77		0.9676	
10/06/08	32.73		0.02	
10/12/08	24.23		0.0234	
10/22/08	48.73		0.1968	
10/25/08	29.92		0.042	
10/28/08	45.02		0.3002	

Winkelman PM_{10} Data in µg/m^3				
Sample Date	PM_{10}		Pb	
	Result	Qualifier	Result	Qualifier
05/19/08	15.58		0.0309	
05/22/08	26.05		0.0375	
05/28/08	59.53		0.0301	
05/31/08	24.74		0.0986	
06/09/08	12.45		0.0227	
06/12/08	26.09		0.0246	
06/15/08	31.39		0.0459	
06/18/08	26.51		0.0586	
06/21/08	34.04		0.0264	
06/24/08	32.37		0.0579	
06/27/08	13.32		0.0075	
06/30/08	11.06		0.0032	
07/03/08	26.58		0.0294	
07/06/08	17.76		0.0141	
07/09/08	6.56		0.0027	*
07/12/08	10.33		0.0067	
07/15/08	16.18		0.0175	
07/21/08	7.54		0.01	
07/24/08	12.61		0.0721	
07/27/08	19.92		0.0089	
07/30/08	19.42		0.0261	
08/02/08	21.55		0.0349	
08/23/08	16.38		0.0306	
08/29/08	9.26		0.003	*
09/01/08	9.2		0.0153	
09/04/08	16.02		0.0163	
09/07/08	10.13		0.0067	
09/12/08	35.42		0.0082	
09/18/08	11.63		0.0189	
09/24/08	10.43		0.0141	
09/30/08	19.94		0.0033	*
10/06/08	17.35		0.0201	
10/13/08	16.09		0.0529	
10/16/08	9.58		0.0124	
10/19/08	12.96		0.0247	
10/22/08	17.79		0.0100	
10/25/08	17.34		0.0382	
10/28/08	19.02		0.0041	

Hayden PM_{10} Data in µg/m^3				
Sample Date	PM_{10}		Pb	
	Result	Qualifier	Result	Qualifier
11/09/08	177.21		0.0887	
11/12/08	32.81		0.0071	
11/21/08	100.34		0.984	
11/24/08	37.59		0.111	
11/27/08	14.12		0.1731	
11/30/08	21.24		0.0328	
12/06/08	14.830		0.0113	
12/12/08	17.500		0.1094	
12/15/08	20.500		0.1166	
12/27/08	9.747		0.0944	
12/30/08	13.330		0.0115	
Average	33.326		0.1128	

Winkelman PM_{10} Data in µg/m^3				
Sample Date	PM_{10}		Pb	
	Result	Qualifier	Result	Qualifier
10/31/08	20.63		0.0848	
11/03/08	15.95		0.0109	
11/06/08	10.4		0.0144	
11/09/08	77.09		0.0824	
11/12/08	16.87		0.0263	
11/15/08	23.72		0.0033	*
11/18/08	13.77		0.0033	*
11/21/08	43.55		0.0030	
11/24/08	16.64		0.0066	
11/27/08	7.43		0.0314	
11/30/08	12.91		0.0647	
12/03/08	12.2		0.0377	
12/06/08	9.43		0.0266	
12/09/08	12.7		0.0285	
12/12/08	8.583		0.0103	
12/24/08	9.042		0.0168	
Average	18.36		0.0276	

* = The result is less than three times the level of uncertainty.

NA = Not available

R = Rejected due to filter damage

Pb-PM_{10} Standard Conditions 3-Year Summary Statistics								
JLG Supersite AQS# 04-013-9997 AAAD# 16328								
Year	Month	No. of Possible Samples	No. of Creditable Samples	Monthly Data Capture (%)	No. of Extra Samples	Monthly Average Lead ($\mu g/m^3$)	3-Month Data Capture (%)	3-Month Average Lead ($\mu g/m^3$)
2006-2008 COMPLIANCE VALUES								
2006	January *	5	5	100	0	0.0055	33	0.01
	February **	5	4	80	0	0.0060	60	0.01
	March	5	5	100	0	0.0022	93	0.00
	April	5	5	100	0	0.0032	93	0.00
	May	5	5	100	0	0.0032	100	0.00
	June	5	4	80	0	0.0030	93	0.00
	July	5	5	100	0	0.0018	93	0.00
	August	5	5	100	0	0.0028	93	0.00
	September	5	5	100	0	0.0026	100	0.00
	October	5	5	100	0	0.0026	100	0.00
	November	5	5	100	0	0.0080	100	0.00
	December	6	6	100	0	0.0085	100	0.01
2007	January	5	5	100	0	0.0040	100	0.01
	February	4	4	100	0	0.0038	100	0.01
	March	6	6	100	0	0.0035	100	0.00
	April	5	4	80	0	0.0045	93	0.00
	May	5	5	100	0	0.0028	93	0.00
	June	5	5	100	0	0.0042	93	0.00
	July	5	5	100	0	0.0040	100	0.00
	August	5	4	80	0	0.0025	93	0.00
	September	5	5	100	0	0.0026	93	0.00
	October	5	5	100	0	0.0044	93	0.00
	November	5	5	100	0	0.0086	100	0.01
	December	5	5	100	0	0.0058	100	0.01
2008	January	6	6	100	0	0.0028	100	0.01
	February	4	4	100	0	0.0063	100	0.00
	March	6	5	83	0	0.0040	94	0.00
	April	5	4	80	0	0.0080	88	0.01
	May	5	5	100	0	0.0046	88	0.01
	June	5	5	100	0	0.0036	93	0.01
	July	5	4	80	0	0.0018	93	0.00
	August	5	4	80	0	0.0015	87	0.00
	September	5	4	80	0	0.0038	80	0.00
	October	5	5	100	0	0.0044	87	0.00
	November	5	5	100	0	0.0066	93	0.00
	December	5	5	100	0	0.0052	100	0.01
* January 2006 is not complete as there are no data for November and December 2005.								
** February 2006 is not complete as there are no data for December 2005.								
Invalid 3-month average due to data capture.								
Invalid 3-month average due to data capture and insufficient number of samples.								

JLG Supersite PM_{10} Data in ($\mu g/m^3$)				
Sample Date	PM_{10}		Pb	
	Result	Qualifier	Result	Qualifier
2006				
1/5/2006	39		0.005	
1/11/2006	60		0.008	
1/17/2006	41		0.005	
1/23/2006	35		0.004	
2/1/2006	47		0.007	
2/4/2006		AN		AN
2/10/2006	41		0.005	
2/16/2006	62		0.004	
2/22/2006	45		0.008	
2/28/2006	34		0.006	
3/9/2006	24		0.002	
3/12/2006	9		0.001	
3/18/2006	21		0.002	
3/24/2006	27		0.004	
3/30/2006	22		0.002	
4/5/2006	35		0.002	
4/11/2006	24		0.004	
4/17/2006	32		0.003	
4/23/2006	28		0.003	
4/29/2006	27		0.004	
5/5/2006	31		0.003	
5/11/2006	43		0.004	
5/19/2006	30		0.003	
5/23/2006	27		0.004	
5/29/2006	27		0.002	
6/4/2006	35		0.003	
6/10/2006	20		0.002	
6/16/2006	28		0.005	
6/27/2006	31		0.002	
6/28/2006		AF		AF
7/4/2006	26		0.002	
7/10/2006	23		0.002	
7/16/2006	69		0.002	
7/22/2006	28		0.002	
7/28/2006	16		0.001	
8/3/2006	29		0.002	
8/9/2006	57		0.003	
8/15/2006	19		0.003	
8/21/2006	44		0.004	
8/27/2006	21		0.002	
9/2/2006	25		0.003	
9/8/2006	10		0.001	
9/14/2006	20		0.003	
9/20/2006	29		0.002	
9/26/2006	32		0.004	

JLG Supersite PM_{10} Data in ($\mu g/m^3$)				
Sample Date	PM_{10}		Pb	
	Result	Qualifier	Result	Qualifier
10/2/2006	31		0.005	
10/8/2006	26		0.002	
10/14/2006	15		0.001	
10/20/2006	37		0.004	
10/26/2006	16		0.001	
11/1/2006	51		0.006	
11/7/2006	57		0.007	
11/13/2006	55		0.009	
11/19/2006	53		0.01	
11/25/2006	38		0.008	
12/1/2006	70		0.01	
12/7/2006	44		0.005	
12/13/2006	67		0.009	
12/19/2006	33		0.005	
12/25/2006	46		0.005	
12/31/2006	91		0.017	
2007				
1/9/2007	30		0.004	
1/12/2007	26		0.002	
1/18/2007	25		0.005	
1/24/2007	38		0.006	
1/30/2007	19		0.003	
2/5/2007	29		0.005	
2/11/2007	31		0.005	
2/17/2007	22		0.003	
2/23/2007	27		0.002	
3/1/2007	22		0.002	
3/7/2007	40		0.005	
3/13/2007	43		0.005	
3/19/2007	28		0.003	
3/25/2007	16		0.003	
3/31/2007	22		0.003	
4/6/2007	33			
4/12/2007	85	a	0.006	(a)
4/18/2007	45		0.006	
4/24/2007	14		0.002	
4/30/2007	33		0.004	
5/6/2007	14		0.001	
5/12/2007	32		0.003	
5/18/2007	31		0.004	
5/24/2007	31		0.003	
5/30/2007	31		0.003	
6/5/2007	43		0.005	
6/11/2007	30		0.007	
6/17/2007	31		0.004	
6/23/2007	30		0.002	

JLG Supersite PM_{10} Data in ($\mu g/m^3$)				
Sample Date	PM_{10}		Pb	
	Result	Qualifier	Result	Qualifier
6/29/2007	27		0.003	
7/5/2007	44		0.006	
7/11/2007	28		0.004	
7/17/2007	46		0.003	
7/23/2007	36		0.004	
7/29/2007	14		0.003	
8/8/2007	29		0.003	
8/10/2007		AN		AF (AN)
8/16/2007	28		0.002	
8/22/2007	27		0.002	
8/28/2007	27		0.003	
9/3/2007	23		0.002	
9/9/2007	28		0.002	
9/15/2007	48		0.003	
9/21/2007	42		0.002	
9/27/2007	33		0.004	
10/3/2007	30		0.004	
10/9/2007	37		0.004	
10/15/2007	36		0.004	
10/21/2007	57		0.005	
10/27/2007	43		0.005	
11/2/2007	56		0.008	
11/8/2007	70		0.012	
11/14/2007	47		0.006	
11/20/2007	49		0.009	
11/26/2007	50		0.008	
12/4/2007	45		0.006	
12/8/2007	17		0.002	
12/14/2007	25		0.003	
12/20/2007	40		0.012	
12/26/2007	30		0.006	
2008				
01/01/2008	13		0.001	
01/07/2008	10		0.001	
01/13/2008	29		0.005	
01/19/2008	33		0.006	
01/25/2008	16		0.003	
01/31/2008	10		0.001	
02/06/2008	24		0.006	
02/12/2008	40		0.011	
02/18/2008	33		0.004	
02/24/2008	22		0.004	
03/01/2008	30		0.008	
03/07/2008	26		0.003	
03/13/2008	33		0.005	
03/19/2008		AF		(AF)

JLG Supersite PM_{10} Data in ($\mu g/m^3$)				
Sample Date	PM_{10}		Pb	
	Result	Qualifier	Result	Qualifier
03/29/2008	31		0.002	
03/31/2008	34		0.002	
04/06/2008	27		0.008	
04/12/2008	20		0.007	
04/18/2008		AJ		AJ
04/24/2008	41		0.009	
04/30/2008	33		0.008	
05/06/2008	22		0.007	
05/12/2008	49		0.009	
05/18/2008	23		0.003	
05/24/2008	22		0.001	
05/30/2008	28		0.003	
06/05/2008	102		0.003	
06/11/2008	31		0.002	
06/17/2008	39		0.004	
06/23/2008	34		0.004	
06/29/2008	31		0.005	
07/05/2008	23		0.001	
07/11/2008		AS		AM (AS)
07/17/2008	22		0.002	
07/23/2008	24		0.003	
07/29/2008	23		0.001	
08/04/2008	27		0.001	
08/10/2008	38		0.001	
08/16/2008	17		0.002	
08/22/2008	30		0.002	
08/28/2008		AV		AV
09/03/2008		AN		AN
09/09/2008	24		0.003	
09/15/2008	21		0.003	
09/21/2008	19		0.001	
09/27/2008	25		0.008	
10/03/2008	38		0.003	
10/09/2008	31		0.005	
10/15/2008	19		0.002	
10/21/2008	30		0.004	
10/27/2008	65		0.008	
11/02/2008	34		0.008	
11/08/2008	38		0.006	
11/14/2008	38		0.006	
11/20/2008	44		0.006	
11/26/2008	26		0.007	
12/04/2008	41		0.009	
12/08/2008	34		0.008	
12/14/2008	23		0.002	
12/20/2008	38		0.006	

JLG Supersite PM_{10} Data in ($\mu g/m^3$)				
Sample Date	PM_{10}		Pb	
	Result	Qualifier	Result	Qualifier
12/26/2008	38		0.001	

EPA Air Quality System (AQS) Missing Value and Qualifier codes:	
a	Exceptional Event flag requested for this sample
AF	Scheduled but not collected
AJ	Filter Damage
AM	Miscellaneous Void
AN	Machine Malfunction
AS	Poor Quality Assurance Results

Appendix B
3-Month Average Lead Concentration Calculations
For the Hayden Maintenance Yard Monitor

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Appendix B
3-Month Average Lead Concentration Calculations
For the Hayden Maintenance Yard Monitor

2007 Monthy/3-Month Summary – Pb-PM10 Standard Conditions

Invalid 3-month average due to data capture

Invalid 3-month average due to data capture and insufficient number of samples.

Month	No. of Possible Samples	No. of Creditable Samples	Monthly Data Capture (%)	No. of Extra Samples	Monthly Average Lead (µg/m^3)	3-Month Data Capture (%)	3-Month Average Lead (µg/m^3)
January #	5	4	80	0	0.1248	67	0.12
February ^	5	5	100	0	0.0158	73	0.08
March	5	4	80	0	0.0715	87	0.07
April	5	3	60	0	0.0240	80	0.04
May ^	5	4	80	0	0.0348	73	0.04
June	5	5	100	0	0.0262	80	0.03
July	6	5	83	0	0.0380	88	0.03
August	5	5	100	0	0.1234	94	0.06
September	5	5	100	0	0.1950	94	0.12
October	5	4	80	1	0.1214	93	0.15
November	5	5	100	0	0.0874	93	0.13
December #	6	2	33	0	0.1525	71	0.12

Valid 3-month average (may include data substitution).

^ Data Capture <75% and average is below the NAAQS, so data substitution is not allowed. As a result, this is not a valid 3-month average.

Data Capture <75% and number of samples for month in the design value period is insufficient; thus data substitution [See 40 CFR 50 Appendix R § 4(c)(ii)(A)] not done and 3-month average is invalid.

Above the NAAQS test - February 2007

Month	No. of Possible Samples	No. of Creditable Samples	Monthly Data Capture (%)	No. of Extra Samples	Monthly Average Lead (µg/m^3)	3-Month Data Capture (%)	3-Month Average Lead (µg/m^3)
December ~	5	3	60	0	0.0613		
January	5	4	80	0	0.1248		
February	5	5	100	0	0.0158	80	0.07

~ December had 1 sample substituted with 0.011 µg/m^3 from 12/6/2008 for 2006-2008 Design Value period to get the February 2007 Data Capture >75%.

Above the NAAQS test - May 2007

Month	No. of Possible Samples	No. of Creditable Samples	Monthly Data Capture (%)	No. of Extra Samples	Monthly Average Lead (µg/m^3)	3-Month Data Capture (%)	3-Month Average Lead (µg/m^3)
March	5	4	80	0	0.0715		
April ~	5	4	80	0	0.0203		
May	5	4	80	0	0.0348	80	0.04

~ April had 1 sample substituted with 0.009 µg/m^3 from 4/24/2008 for 2006-2008 Design Value period to get the May 2007 Data Capture >75%.

2008 Monthy/3-Month Summary – Pb-PM10 Standard Conditions

Invalid 3-month average due to data capture

Invalid 3-month average due to data capture and insufficient number of samples.

Month	No. of Possible Samples	No. of Creditable Samples	Monthly Data Capture (%)	No. of Extra Samples	Monthly Average Lead (µg/m^3)	3-Month Data Capture (%)	3-Month Average Lead (µg/m^3)
January #	5	2	40	0	0.1045	58	0.11
February ^	5	3	60	0	0.0377	44	0.10
March ^	5	4	80	0	0.0400	60	0.06
April ^	5	4	80	2	0.1193	73	0.07
May	5	5	100	2	0.0756	87	0.08
June	5	3	60	4	0.0714	80	0.09
July	5	5	100	3	0.0653	80	0.07
August ^	5	3	60	4	0.1560	73	0.10
September	5	4	80	0	0.2880	80	0.17
October ^^	5	4	80	1	0.1162	73	0.19
November ^^	5	3	60	3	0.2325	73	0.21
December #	5	4	80	1	0.0682	73	0.14

Valid 3-month average (may include data substitution).

^ Data Capture <75% and average is below the NAAQS, so data substitution is not allowed. As a result, this is not a valid 3-month average.

^^ Data Capture <75% and average is the above the NAAQS; 40 CFR 50 Appendix R § 4(c)(ii)(A) allows use of the LOWEST data value recorded during the same month over the design period as a substitute for the missing sample(s) up to minimum 75% data capture. This 3-month average is valid.

Data Capture <75% and number of samples for month in the design value period is insufficient; thus, data substitution not done and 3-month average is invalid.

Above the NAAQS test - February 2008

Month	No. of Possible Samples	No. of Creditable Samples	Monthly Data Capture (%)	No. of Extra Samples	Monthly Average Lead (µg/m^3)	3-Month Data Capture (%)	3-Month Average Lead (µg/m^3)
December ~	6	6	100	0	0.0522		
January ~	5	4	80	0	0.0543		
February	5	3	60	0	0.0377	80	0.05

~ December had 4 samples substituted with 0.002 µg/m^3 from 12/21/2006 and January had 2 samples substituted with 0.004 µg/m^3 from 1/20/2007 for 2006-2008 Design Value period to get the February 2008 Data Capture >75%.

Above the NAAQS test - March 2008

Month	No. of Possible Samples	No. of Creditable Samples	Monthly Data Capture (%)	No. of Extra Samples	Monthly Average Lead (µg/m^3)	3-Month Data Capture (%)	3-Month Average Lead (µg/m^3)
January ~	5	5	100	0	0.0442		
February	5	3	60	0	0.0377		
March	5	4	80	1	0.0400	80	0.04

~ January had 3 samples substituted with 0.004 µg/m^3 from 1/20/2007 for 2006-2008 Design Value period to get the March 2008 Data Capture >75%.

Above the NAAQS test - April 2008

Month	No. of Possible Samples	No. of Creditable Samples	Monthly Data Capture (%)	No. of Extra Samples	Monthly Average Lead (µg/m^3)	3-Month Data Capture (%)	3-Month Average Lead (µg/m^3)
February ~	5	4	80	0	0.0295		
March	5	4	80	1	0.0400		
April	5	4	80	2	0.1193	80	0.06

~ February had 1 sample substituted with 0.005 µg/m^3 from 2/1/2007 for 2006-2008 Design Value period to get the April 2008 Data Capture >75%.

Above the NAAQS test - August 2008

Month	No. of Possible Samples	No. of Creditable Samples	Monthly Data Capture (%)	No. of Extra Samples	Monthly Average Lead (µg/m^3)	3-Month Data Capture (%)	3-Month Average Lead (µg/m^3)
June ~	5	4	80	4	0.0630		
July	5	5	100	3	0.0653		
August	5	3	60	4	0.1560	80	0.09

~ June had 1 sample substituted with 0.004 µg/m^3 from 6/7/2007 for 2006-2008 Design Value period to get the August 2008 Data Capture >75%.

Above the NAAQS test - October 2008

Month	No. of Possible Samples	No. of Creditable Samples	Monthly Data Capture (%)	No. of Extra Samples	Monthly Average Lead (µg/m^3)	3-Month Data Capture (%)	3-Month Average Lead (µg/m^3)
August ~	5	4	80	4	0.1383		
September	5	4	80	0	0.2880		
October	5	4	80	1	0.1162	80	0.18

~ August had 1 sample substituted with 0.014 µg/m^3 from 8/6/2007 for 2006-2008 Design Value period to get the October 2008 Data Capture >75%.

Above the NAAQS test - November 2008

Month	No. of Possible Samples	No. of Creditable Samples	Monthly Data Capture (%)	No. of Extra Samples	Monthly Average Lead (µg/m^3)	3-Month Data Capture (%)	3-Month Average Lead (µg/m^3)
September	5	4	80	0	0.2880		
October	5	4	80	1	0.1162		
November ~	5	4	80	3	0.1999	80	0.20

~ November had 1 sample substituted with 0.004 µg/m^3 from 11/13/2007 for 2006-2008 Design Value period to get the November 2008 Data Capture >75%.

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Appendix C

CH2M Hill Technical Memorandum: Preliminary Evaluation of PM_{10} and Metals Concentrations from October 2007 to December 2008 in Ambient Air at the Hayden and Winkelman Monitoring Stations

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Preliminary Evaluation of PM_{10} and Metals Concentrations from October 2007 to December 2008 in Ambient Air at the Hayden and Winkelman Monitoring Stations

ASARCO LLC Hayden Plant Site, Arizona

PREPARED FOR: John Hillenbrand/ US EPA

PREPARED BY: Prabhat Bhargava/CH2M HILL

COPIES: Allan Erickson/CH2M HILL

DATE: December 31, 2008

PROJECT NUMBER: 381679

Introduction

The purpose of this Technical Memorandum (TM) is to provide an updated evaluation of air data collected after the "*Remedial Investigation Report for the ASARCO LLC Hayden Plant Site*" (RI Report, CH2M HILL, August 2008) was produced. The RI Report presented the air monitoring results for the period October 22, 2006 through November 7, 2008. This TM describes the air monitoring results for PM_{10} and selected metals (including arsenic, lead, copper, cadmium, and chromium) collected at the Hayden and Winkelman stations during the period of November 13, 2007 through December 9, 2008.

The air investigation involves collection of meteorological, PM_{10}, and metals data from two air monitors installed as part of this study. The Hayden monitoring station was placed on the roof of the Town of Hayden maintenance building. The Winkelman monitoring station was placed on the roof of the Hayden High School gymnasium (located in Winkelman).

The air monitoring stations were programmed to collect samples on pre-loaded filters for a 24-hour period from midnight to midnight. One 24-hour sample was collected every 6th-day until an increase of sampling frequency (every 3rd-day) was implemented on March 28, 2008. The meteorological data (average ambient temperature, relative humidity, wind speed, and wind direction) are collected every 30 minutes on a continuous daily basis.

The sample filters collected during these periods were submitted for analysis of PM_{10} by gravimetric method and for metals analysis of the PM_{10} fraction by EPA Compendium Method IO-3.3 using X-ray Fluorescence Spectroscopy. All laboratory analyses were conducted by Chester LabNet of Tigard, Oregon.

Sample collection was not available from November 13, 2007 to January 12, 2008 and April 1, 2008 to May 15, 2008 at the Winkelman station due to air sampling pump failure within

the unit, which required replacement of the pump. Furthermore, due to apparent power surging issues at the Hayden station, 13 samples (October through December 2008) were not collected. 17 air filter samples were rejected because of torn filters received at the laboratory or the quantitation limits for some analytes were rejected due to QC outliers that did not meet the minimum requirements for acceptability. Despite the absence of these Hayden and Winkelman samples, the resulting data set is considered sizable enough for evaluation purposes in this TM.

The air monitoring results from the Hayden and Winkelman air monitoring stations are compared with background concentrations from the Organ Pipe National Monument station, as provided in the RI Report. The existing background dataset referenced in the RI Report was used for the current evaluation in this TM.

Air Quality Results in Hayden and Winkelman Stations

Following validation of the laboratory data, summary tables were created containing the results and any data qualifiers. Tables 1 and 2 provide a summary of the air sampling results for PM_{10} and metals for the Hayden and Winkelman stations, respectively. These tables also show the regulatory comparison criteria and a 24-hour windrose for each day PM_{10} samples were collected.

The metals results reported by Chester LabNet include an uncertainty value, in accordance with the XRF analytical procedure in EPA Method IO-3.3. The uncertainty measurement represents the statistical range in which a measurement may fall. For a Gaussian distribution, a one-sigma uncertainty would describe the range of possible values (by adding and subtracting the uncertainty to the reported value) with 68% confidence, while a three-sigma uncertainty would describe the range at 99.7% confidence. The uncertainties reported by the laboratory are one sigma uncertainties. Based on discussions with the laboratory and a review of practices used to evaluate air quality data at other sites, a three sigma uncertainty was used for review of data for this Site. When a measured value is above the three-sigma MDL uncertainty, it is considered a detected result, and is reported as is. If it is found below the three-sigma uncertainty, it is considered a nondetected result, and the three-sigma uncertainty value is provided in the summary tables. For some samples, the three-sigma MDL uncertainty is above the regulatory criteria, as indicated in Tables 1 and 2. This data evaluation approach is identical to the one followed in the RI Report.

In general, the concentrations of PM_{10} and metals at the two stations were likely affected by relative locations of the emission sources, the variation of the emission rates of the sources, and meteorological conditions such as wind direction and speed.

PM_{10} Concentration Summary

Following data validation there are 54 available results for PM_{10} at the Hayden station and 54 results available for the Winkelman station. The average PM_{10} value for the Hayden station (34.7 $\mu g/m^3$) over this period is about 1.9 times the average PM_{10} value at the Winkelman station (17.9 $\mu g/m^3$). These concentrations both exceed the Organ Pipe station background average value (16 $\mu g/m^3$).

Figure 1 shows the comparison of PM_{10} concentrations at the two RI stations and the average wind speed monitored at the Hayden station (since wind speeds were generally

similar at both stations). In general, PM_{10} concentrations were observed to be higher at the Hayden station than the Winkelman station. No elevated concentrations of PM_{10} were measured at the Winkelman station if the wind was not blowing from the direction of smelter, concentrator or tailing piles. The highest or lowest PM_{10} concentrations at both monitoring stations did not necessarily occur on days with the highest or lowest wind speed, respectively.

The highest concentrations of PM_{10} were found on November 9, 2008 at both the Hayden (177.2 $\mu g/m^3$) station and the Winkelman (77.1 $\mu g/m^3$) station. The measured PM_{10} concentration at the Hayden station on November 9, 2008 exceeded the NAAQS 24-hour PM_{10} value of 150 $\mu g/m^3$. The windrose diagrams, provided in Tables 1 and 2, indicate that the average wind speed on November 9, 2008 was moderate to high. For the Hayden station, upwind sources of PM_{10} emissions during the higher wind speed on that day included the tailings impoundments (to the southwest), open areas west of Hayden (to the west), and the track hopper, CF and Conveyer 9 area (to the southeast). For the Winkelman station, upwind sources of PM_{10} emissions included open spaces and tailings impoundments (to the south and west).

Metal Concentrations Summary

The concentrations of metals in the PM_{10} filters, including arsenic, lead, copper, and chromium, were evaluated for both the Hayden and Winkelman stations. The concentrations of arsenic, lead, copper, and chromium during the monitoring period are shown in Figures 2 through 5, respectively.

Arsenic Concentrations at Hayden Station. Of the 54 samples collected in Hayden during the reporting period and analyzed for metals, 46 (85%) exceeded the arsenic ambient air PRG of 0.00045 $\mu g/m^3$. The five most elevated arsenic concentrations were found on November 24, 2008 (0.0469 $\mu g/m^3$); August 5, 2008 (0.0518 $\mu g/m^3$); April 12, 2008 (0.0970 $\mu g/m^3$); May 16, 2008 (0.0830 $\mu g/m^3$); September 30, 2008 (0.1554 $\mu g/m^3$).

During most of these sample periods, the prevailing wind direction was from the northeast, and the ASARCO smelter facility was generally upwind. The maximum arsenic concentration (0.1554 $\mu g/m^3$ on September 30, 2008) is about 345 times the ambient air PRG. Although the Hayden station sample from November 09, 2008 (177.21 $\mu g/m^{3)}$ had the highest PM_{10} reading, an elevated concentration of arsenic was not found on this day.

The average arsenic concentration at the Hayden station (0.0209 $\mu g/m^3$) is about 35-70 times higher than the range of arsenic MDL values (0.0003 – 0.0006 $\mu g/m^3$) at the Organ Pipe station, as described in the RI Report.

Arsenic Concentrations at Winkelman Station. Of the 54 samples collected in Winkelman during the reporting period and analyzed for metals, 43 (80%) exceeded the arsenic ambient air PRG of 0.00045 $\mu g/m^3$. As shown on Table 2, the five most elevated arsenic concentrations were found on January 12, 2008; June 24, 2008; August 2, 2008; November 9, 2008; and November 30, 2008 (highest).

During most of these sample periods, the prevailing wind direction was from the northwest, and the ASARCO smelter and concentrator facilities were generally upwind. The maximum arsenic concentration (0.0339 $\mu g/m^3$, measured on November 30, 2008) is about 77 times the

PRG, and about 6.7 times lower than the maximum value recorded in Hayden over this period. Also, the elevated arsenic concentration days in Hayden and Winkelman did not coincide.

The average arsenic concentration at the Winkelman station (0.008 µg/m^3) is about 13-26 times higher than the range of MDL values (0.0003 – 0.0006 µg/m^3) at the Organ Pipe station, as described in the RI Report .

Lead Concentrations in Hayden and Winkelman. USEPA made revisions to the primary and secondary National Ambient Air Quality Standards (NAAQS) for lead (Pb) on October 15, 2008. With regard to the primary standard, USEPA has revised the level to 0.15 µg/m3. The revised standard is 1/10th of the previous standard. USEPA retained the current indicator of lead in total suspended particles (Pb-TSP). USEPA revised the averaging time to a rolling 3-month period with a maximum (not-to be- exceeded) form. USEPA has revised the secondary standard to be identical in all respects to the revised primary standard. Even though a complete three month data set has not been collected for lead since promulgation of new standard, the collected data was compared to revised NAAQS for lead.

As shown in Figure 3, the concentration pattern for lead in the Hayden and Winkelman samples was very similar to arsenic, with the elevated concentrations occurring on the same dates. The maximum lead concentration (0.968 µg/m^3 on September 30, 2008) in Hayden (Table 1) corresponded to the same sample for which the maximum arsenic concentration was found; this lead concentration in the PM_{10} sample is about 6.5 times the lead NAAQS of 0.15 µg/m^3 (rolling 3-month average value). The average lead concentration in Hayden (0.101 µg/m^3) is about 76 times the Organ Pipe station average background value of 0.00133 µg/m^3. The three-month rolling average concentrations for lead at the Hayden monitoring station for the months that ended in September 2008 (0.172 µg/m^3), October 2008 (0.184 µg/m^3) and November 2008 (0.152 µg/m^3) exceeded NAAQS for lead.

The maximum lead concentration (0.207 µg/m^3 on January 12, 2008) in Winkelman (Table 2) corresponded to the third highest arsenic concentration sample, is about 38% higher than the NAAQS of 0.15 µg/m^3, and is about 4.7 times lower than the maximum lead value recorded in Hayden. However, the average lead concentration in Winkelman (0.0283 µg/m^3) is about 21 time higher than the Organ Pipe station average background value of 0.00133 µg/m^3. None of the three month rolling averages at the Winkelman station exceeded the NAAQS for lead.

It is important to note that federal lead NAAQS is based on using a Total Suspended Particulate (TSP) monitor. Use of the PM_{10} sampler may show a lower observed value than measured by a TSP sampler.

Copper Concentrations in Hayden and Winkelman. As shown in Figure 4, the concentration pattern for copper in the Hayden and Winkelman samples was very similar to arsenic and lead, with the elevated concentrations occurring on the same dates. There is no PRG or NAAQS for copper, and the California Acute REL is 100 µg/m^3 (1 hour average). The maximum copper concentration (3.82 µg/m^3 on September 30, 2008) in Hayden was well below the Acute REL. The average copper concentration in Hayden (0.502 µg/m^3) is about 353 times higher than the Organ Pipe station average background value of 0.00142 µg/m^3.

The maximum copper concentration (1.39 µg/m^3 on November 9, 2008) in Winkelman corresponded to the highest PM_{10} concentration dates. The maximum copper concentration in Winkelman is about three times lower than the maximum value recorded in Hayden. The average copper concentration at the Winkelman station (0.222 µg/m^3) is about 156 times higher than the background average copper concentration (0.00142 µg/m^3) at the Organ Pipe station.

Chromium Concentrations in Hayden and Winkelman. As shown in Figure 5, the concentration pattern for chromium in the Hayden and Winkelman samples differs from arsenic, copper and lead, with the maximum concentrations occurring on the same dates as the maximum PM_{10} concentrations.

The maximum chromium concentration in Hayden (0.01 µg/m^3) is about 63 times the PRG of 0.00016 µg/m^3. The average chromium concentration (0.00049 µg/m^3) at the Organ Pipe background station is about three times the PRG. However, the average chromium concentration at the Hayden station (0.0013 µg/m^3) is still about 3 times the Organ Pipe station average concentration of 0.00049 µg/m^3. The highest chromium concentration in Winkelman (0.0042 µg/m^3 on November 9, 2008) is about 26 times the PRG. The average chromium concentration at the Winkelman station (0.00066 µg/m^3) is still about 1.3 times the Organ Pipe station average concentration of 0.00049 µg/m^3.

Arsenic to PM_{10} Concentration Ratio. Figure 6 shows the arsenic to PM_{10} concentration ratios at the two stations. A relatively high arsenic to PM_{10} ratio at the Hayden station occurred on March 6, 2008; April 12, 2008; May 16, 2008; August 5, 2008; and September 30, 2008. During the days of high arsenic to PM_{10} ratio coupled with high arsenic concentrations was measured predominantly when wind direction was from the smelter facility toward the Hayden station. No wind data was available for April 12, 2008.

The higher arsenic to PM_{10} ratios at the Winkelman station occurred on the same days when elevated arsenic concentrations were found at the Winkelman station (January 12, 2008; August 8, 2008; and November 30, 2008). During these three days when high arsenic to PM_{10} ratio was measured at the Winkelman station, the predominant wind direction was from the smelter facility toward the Winkelman station.

Cadmium Concentrations in Hayden and Winkelman. For Hayden samples, six cadmium results on May 16, 2008 (0.006 µg/m^3), August 8, 2008 (0.0083 µg/m^3), August 14, 2008 (0.0033 µg/m^3), September 30, 2008 (0.0203 µg/m^3), November 21, 2008 (0.0346 µg/m^3) and November 24, 2008 (0.0037 µg/m^3) exceeded the PRG of 0.0011 µg/m^3. The highest concentration for Hayden (the November 21, 2008 sample) is about 31 times the PRG. Cadmium was not found in the Organ Pipe station samples, with an MDL of 0.0006 µg/m^3; however, the average cadmium concentration at the Hayden station (0.003 µg/m^3) is about 5 times the Organ Pipe station MDL value.

For the Winkelman samples, none of the cadmium results were found to be above MDL for this monitoring period.

Other Metals in Hayden and Winkelman

As indicated in Tables 1 and 2, two exceedances of PRGs were identified for manganese. The manganese concentration in one Winkelman sample (November 9, 2008, 0.0524 µg/m^3)

slightly exceeded the PRG of 0.051 µg/m^3. The manganese exceedance corresponds with the sample date showing the highest PM_{10} concentration in Winkelman.

The manganese concentration in one Hayden sample (November 9, 2008, 0.1113 µg/m^3) also exceeded the PRG of 0.051 µg/m^3. Similar to Winkelman, the manganese exceedance also corresponds with the sample date showing the highest PM_{10} concentration in Hayden.

No other metals results display exceedances of regulatory criteria. However, as indicated on Tables 1 and 2, many metals do not have corresponding regulatory criteria that could be referenced in this report. Also, as described earlier in this TM, the three-sigma uncertainty value exceeded the regulatory criteria for some metals.

Overall Data Results Comparison with Background

As shown in Table 3, the average PM_{10} concentrations at Hayden and Winkelman stations were approximately 2.17 and 1.12 times higher, respectively, than average PM_{10} concentrations at the Organ Pipe station. Arsenic and cadmium were not found above MDLs at the Organ Pipe station. However, the average concentrations of arsenic in Hayden and Winkelman were about 35-70 and 13-26 times the Organ Pipe station MDLs, and exceeded the PRG levels by a factor of 46 and 17, respectively. The average concentrations of cadmium in Hayden and Winkelman exceeded the PRG levels by a factor of 3 and 2, respectively. The average ambient air concentrations of copper, lead, and chromium at the Hayden station were 35, 76, and 3 times greater than average levels at the Organ Pipe station, respectively. Finally, the average ambient air concentration of copper, lead, and chromium at the Winkelman station were 156, 21, and 1.5 times higher, respectively, than average levels at the Organ Pipe station.

Conclusions

In summary, the concentrations of PM_{10} and metals in the Hayden and Winkelman stations exceed background levels. The PM_{10} concentrations in the Hayden station samples are about twice the levels in the Winkelman station samples. The concentrations of arsenic, cadmium, copper, chromium and lead are about 0.8 to 3.6 times higher in Hayden station samples compared to Winkelman station samples and both stations exhibit significantly higher concentrations compared to Organ Pipe (3 to 76 times) and the EPA PRGs (2 to 46 times).

In general, the elevated PM_{10} values were found on the days with relative higher wind speeds; however, the highest values were not found on the days with highest wind speed. The highest PM_{10} concentration at both Hayden and Winkelman monitors occurred on November 9, 2008, when the wind directions were from the tailings impoundments and the track hopper, CF and Conveyor 9 area toward the monitoring stations. Because the wind was not blowing from the smelter facility (as it was on other days with elevated PM_{10} and metals concentrations), it is reasonable to assume that the major sources of the highest PM_{10} concentrations at the two stations were the fugitive dust emissions from the material handling activities and/or from the tailings impoundments and surrounding open spaces with exposed soils. However, lower PM_{10} concentrations were also found on other days when wind was blowing from the material handling facility and the tailing impoundments, but this may be attributed to lower wind speeds.

The PM_{10} concentrations observed at Hayden station were generally higher than at the Winkelman station, indicating that the top contributing sources are located closer to the Hayden station. However, an accurate determination of the major contributors to the PM_{10} concentrations is difficult without using additional analytical tools or specific source-area sampling instruments.

The elevated PM_{10} emissions on November 9, 2008 did not coincide with elevated arsenic, lead, or cadmium concentrations monitored at the Hayden and Winkelman stations, indicating that the fugitive dust emissions from areas to the west and southwest of the monitoring stations were unlikely to be the top contributor for arsenic and lead.

The arsenic and lead data generally show the same trend of concentration changes, and their concentrations were elevated on the same days when the smelter facilities were upwind of the monitors. In addition, arsenic to PM_{10} ratios were much higher on the days with elevated arsenic concentrations. The PM_{10} emissions from the smelter facility would likely contain higher arsenic content compared to the fugitive dust emissions from the material handling or tailings impoundment (wind erosion) areas. The higher arsenic to PM_{10} ratio indicates that the major sources for elevated arsenic and lead concentrations are likely the process generated emissions from the smelter facilities.

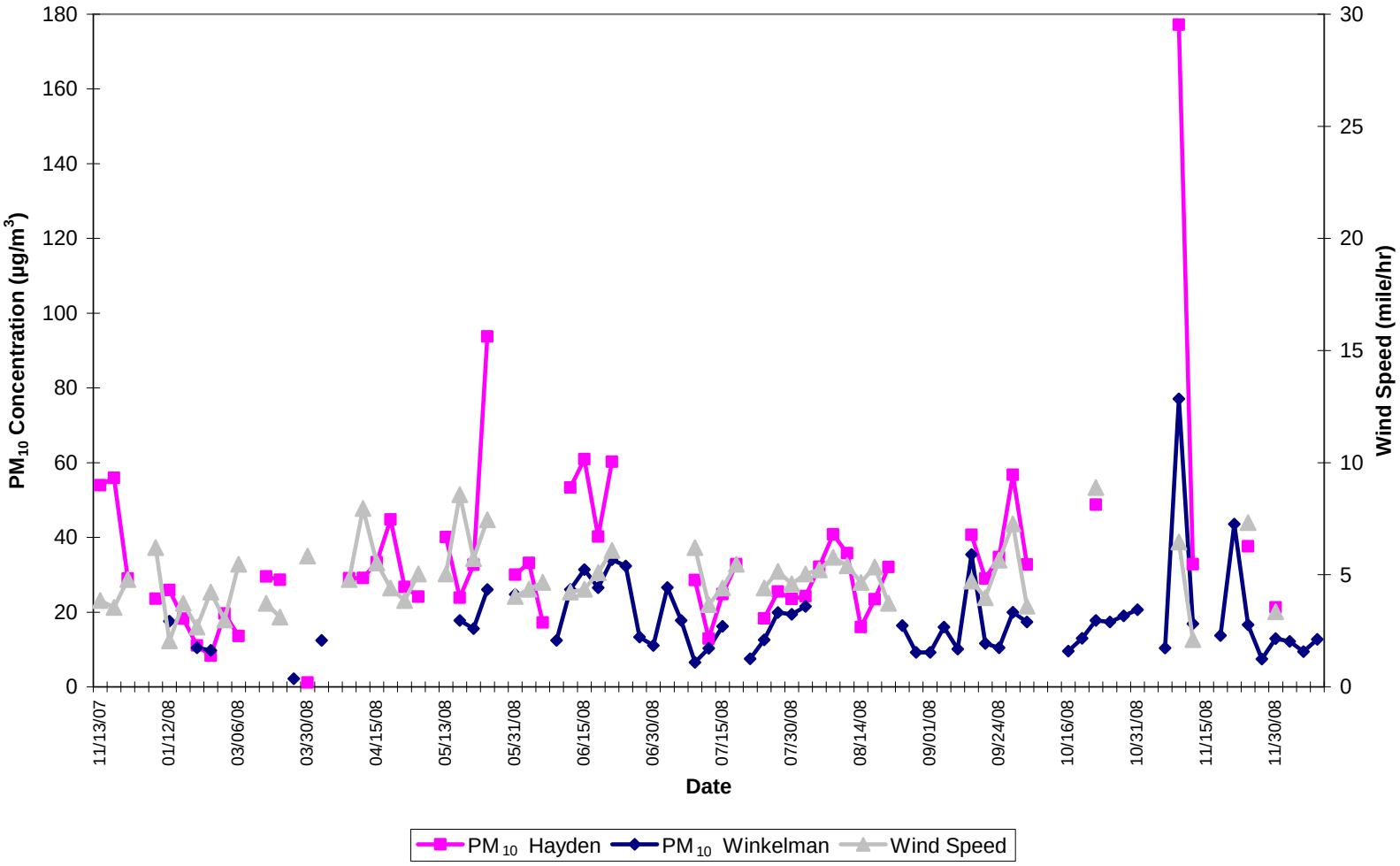
The elevated copper concentrations generally occurred both on the days with elevated arsenic and lead concentrations. These results indicate that copper detected at the Hayden and Winkelman stations may be mostly attributed to the process generated emissions from the smelter facility.

Highest chromium concentrations occurred on the days with highest PM_{10} concentrations at both monitors. However not all elevated chromium concentrations occurred on the days with elevated PM_{10}. The chromium concentrations were not elevated on the days with elevated arsenic and lead concentrations. Therefore, an accurate determination of the major contributors to the chromium concentrations is difficult without using additional analytical tools or specific source-area sampling instruments.

While overall there is consistency, a couple of significant differences during this period (November 13, 2007 through December 9, 2008) of monitoring as compared to the RI Report monitoring (October 2006 through October 2007) are as follows:

- One measured PM_{10} concentration above the 24-hour average National Ambient Air Quality Standard on November 9, 2008 at Hayden Monitoring Station. This elevated PM_{10} concentration was measured while the wind was blowing from west (tailings piles) greater than 12 miles per hour speed towards the monitor. There were no PM_{10} concentrations above the 24-hour average National Ambient Air Quality Standard during the RI Report monitoring period.
- Three measured lead concentrations above the revised EPA National Ambient Air Quality Standard for the rolling 3-month periods ending in September, October and November 2008 (note that data from the RI Report monitoring period were not compared against the new NAAQS value for lead).

Figures



Notes:

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

[2] $\mu g/m^3$ = micrograms per cubic meter

[3] mile/hr = miles per hour

[4] Wind speeds for Hayden and Winkelman stations are very similar, to simplify the figure, only wind speeds at Hayden station are shown.

[5] Revised December 2008

FIGURE 1
PM_{10} CONCENTRATIONS AND WIND SPEED FOR HAYDEN AND WINKELMAN MONITORS
ASARCO, LLC Hayden Plant Site
Hayden, Arizona

The data on this figure are derived from tables 1 and 2.

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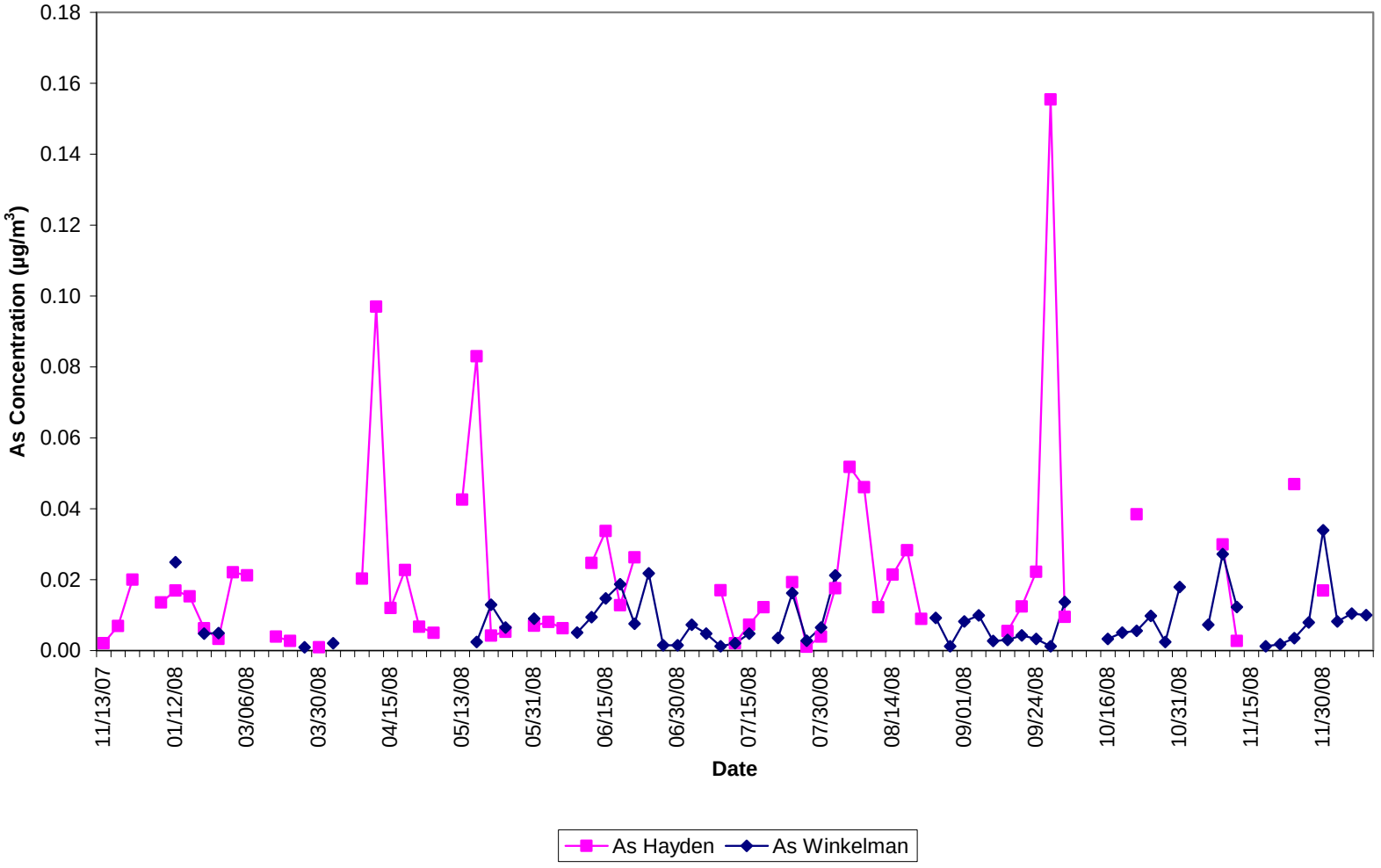

Notes:
[1] As = Arsenic
[2] µg/m^3 = micrograms per cubic meter
[3] Revised December 2008

FIGURE 2
ARSENIC CONCENTRATIONS IN AIR AT HAYDEN AND WINKELMAN STATIONS
ASARCO, LLC Hayden Plant Site
Hayden, Arizona

The data on this figure are derived from tables 1 and 2.

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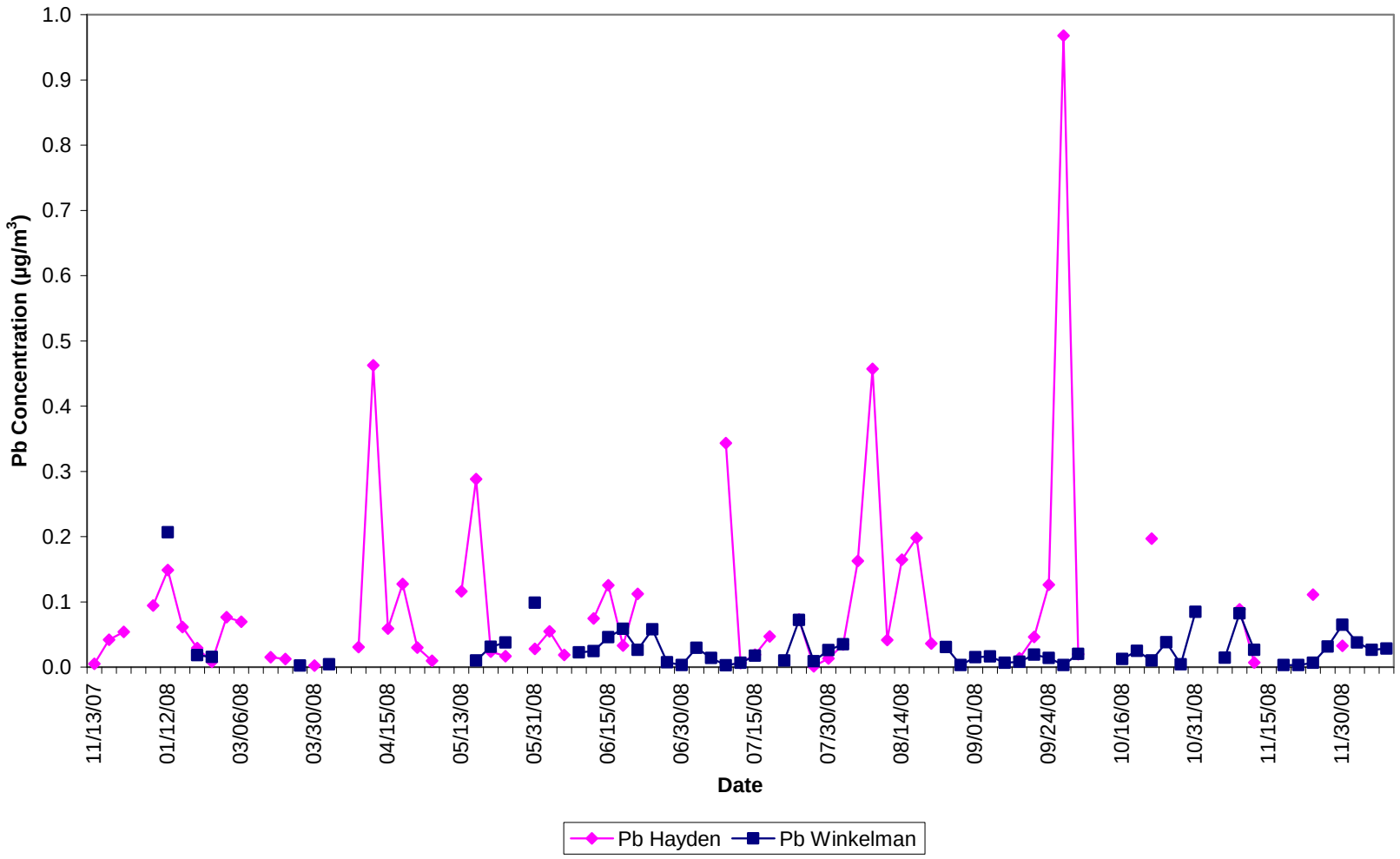

Notes:
[1] Pb = Lead
[2] µg/m^3 = micrograms per cubic meter
[3] Revised December 2008

FIGURE 3
LEAD CONCENTRATIONS IN AIR AT HAYDEN AND WINKELMAN STATIONS
ASARCO, LLC Hayden Plant Site
Hayden, Arizona

The data on this figure are derived from tables 1 and 2.

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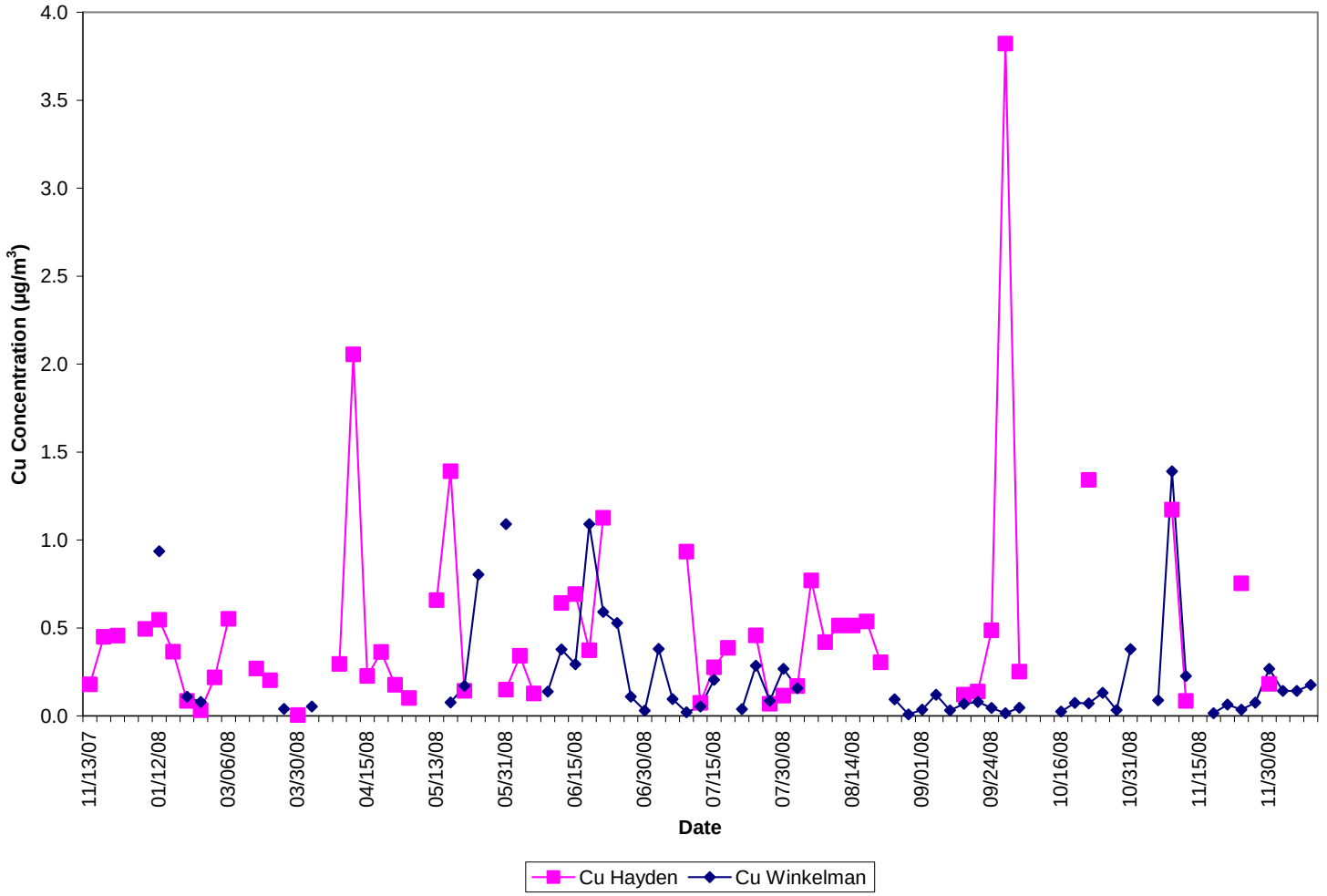

Notes:
[1] Cu = Copper
[2] µg/m^3 = micrograms per cubic meter
[3] Revised December 2008

FIGURE 4
COPPER CONCENTRATIONS IN AIR AT HAYDEN AND WINKELMAN STATIONS
ASARCO, LLC Hayden Plant Site
Hayden, Arizona
The data on this figure are derived from tables 1 and 2.

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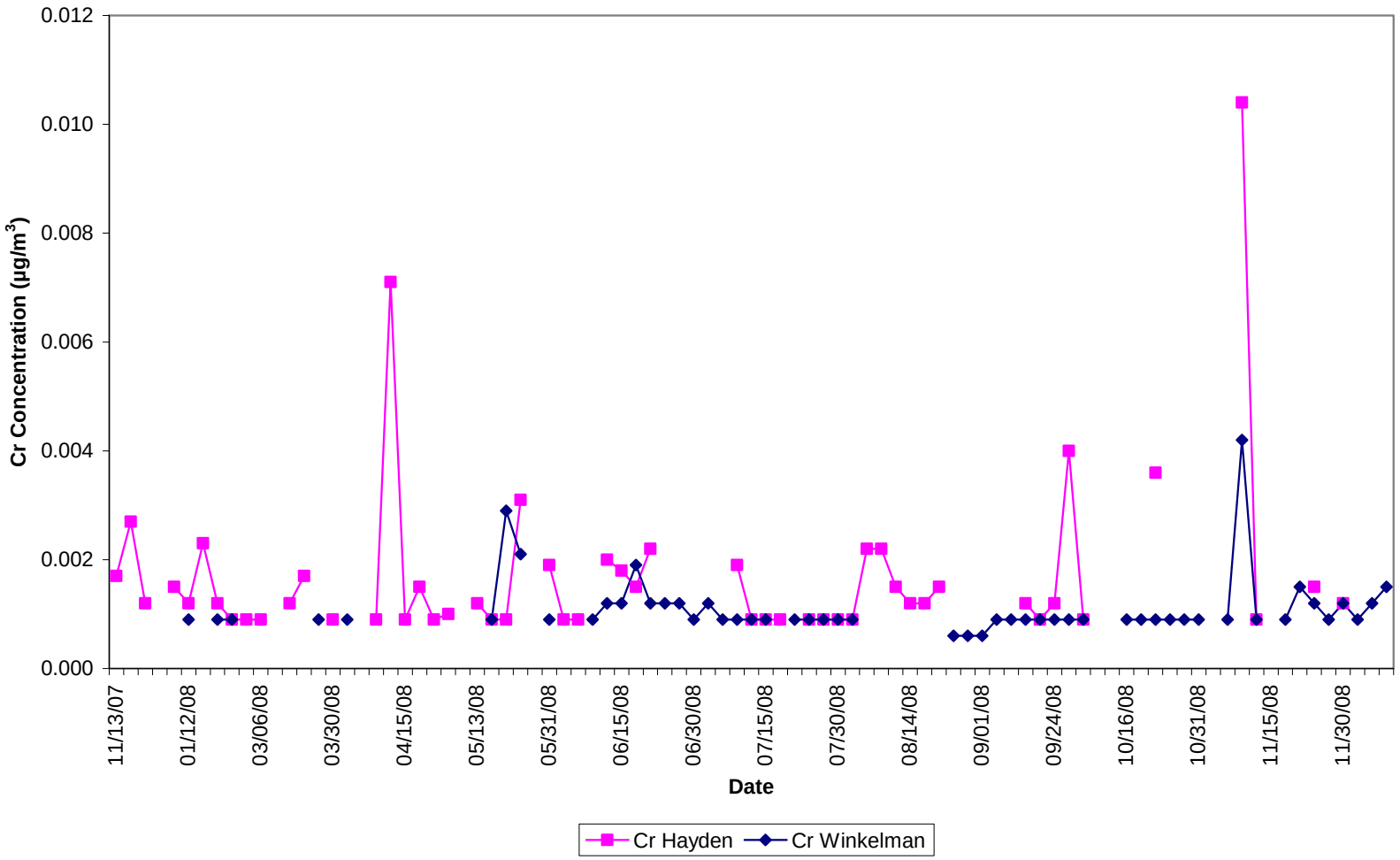

Notes:
[1] Cr = Chromium
[2] µg/m^3 = micrograms per cubic meter
[3] Revised December 2008

FIGURE 5
CHROMIUM CONCENTRATIONS IN AIR AT HAYDEN AND WINKELMAN STATIONS
ASARCO, LLC Hayden Plant Site
Hayden, Arizona

The data on this figure are derived from tables 1 and 2.

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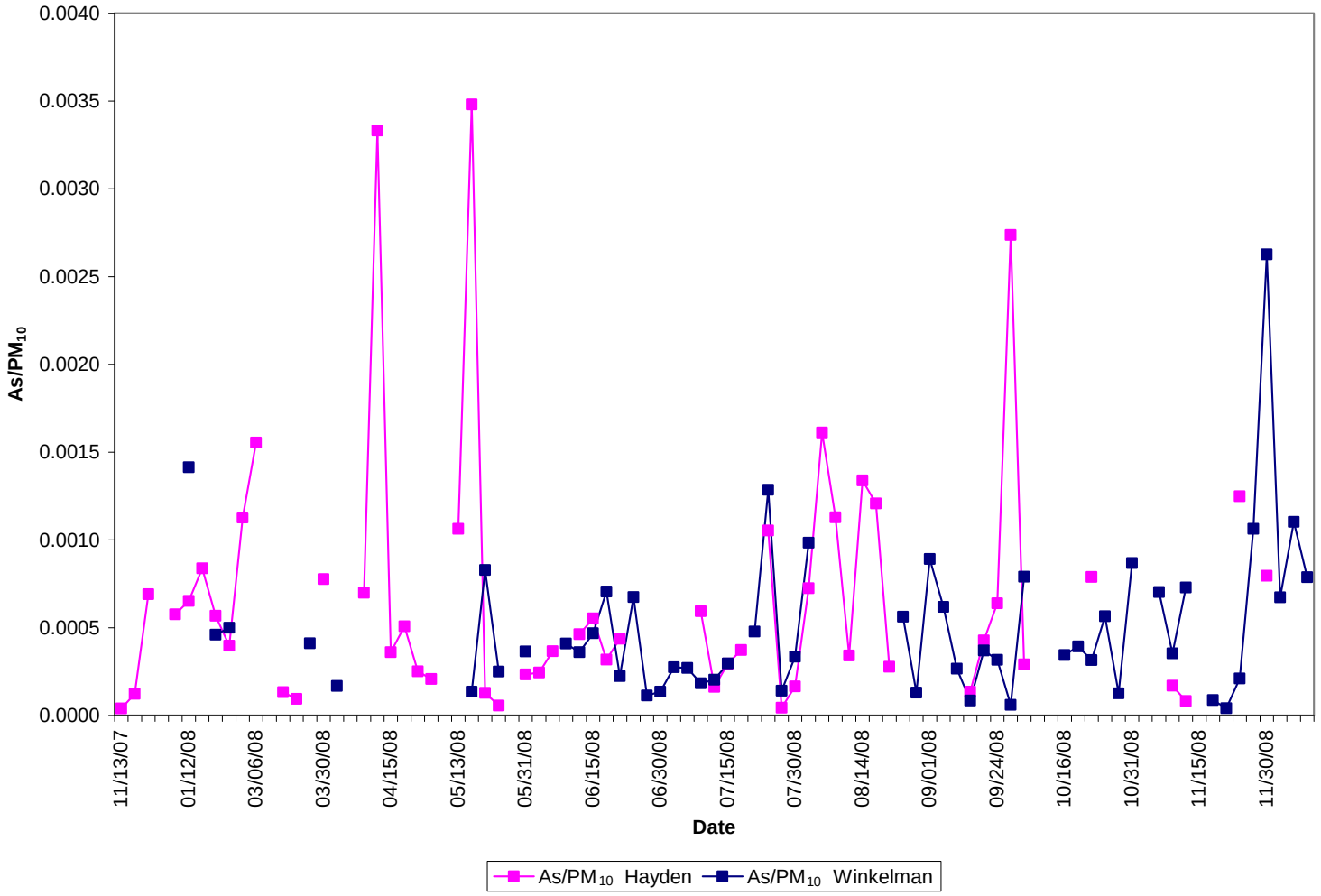

Notes:
[1] As = Arsenic
[2] P_{10} = particulate matter with a diameter less than or equal to 10 microns in size
[3] Revised December 2008

FIGURE 6
ARSENIC TO PM_{10} RATIOS IN AIR AT HAYDEN AND WINKELMAN STATIONS
ASARCO, LLC Hayden Plant Site
Hayden, Arizona
The data on this figure are derived from tables 1 and 2.

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Tables

TABLE 1
Air Filter Sampling Laboratory Values for Inorganic Parameters
Hayden Monitoring Station
Data Evaluation Report
ASARCO LLC Hayden, Arizona Plant Site

Date:								11/13/2007			11/19/2007			11/25/2007			12/7/2007			12/13/2007			1/12/2008		
Avg Wind Speed mph):								3.85			3.54			4.78			NA			6.21			2.05		
Avg Wind Direction (degrees):								151			136			122			NA			85			148		
Avg Ambient Temperature (ºC):								20.9			18.7			11.1			NA			10.5			9.4		
Avg Ambient Relative Humidity (%):								7.8			7.1			10.3			NA			24.1			25.1		
Precipitation (inches)[7]:								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/m[3]	--	--	150 [7]/50 [8]	--	150 [7]	--	**53.97**	NA		**55.97**	NA		28.99	NA		R	NA		23.60	NA		25.89	NA	
Aluminum	µg/m[3]	--	--	--	5.1	--	--	2.0490	4.0300		2.1430	4.0410		0.7519	2.6620		R	R		0.7604	3.3000		0.7072	2.782	
Antimony	µg/m[3]	13,000	1.46	--	--	--	--	0.0081	0.0060	*	0.0093	0.0062	*	0.0087	0.0098	*	R	R		0.009	0.0053	*	0.0093	0	*
Arsenic	µg/m[3]	2,500	0.000441	--	0.00045	--	0.19	***0.0021***	0.0034	*	***0.0069***	0.0114	*	**0.0200**	0.0708		R	R		**0.0136**	0.0588		**0.0169**	0.0663	
Barium	µg/m[3]	--	--	--	0.52	--	--	0.0195	0.0384		0.0222	0.0263	*	0.0105	0.0165	*	R	R		0.0111	0.0231	*	0.0137	0.0541	
Bismuth	µg/m[3]	--	--	--	--	--	--	NA	NA		0.0125	0.0235		0.0241	0.0852		R	R		0.0374	0.1624		0.0277	0.1091	
Bromine	µg/m[3]	--	--	--	--	--	--	0.0020	0.0039		0.0011	0.0020		0.0009	0.0025	*	R	R		0.0017	0.0074		0.0012	0.0028	*
Cadmium	µg/m[3]	250	0.00105	--	0.0011	--	--	***0.0057***	0.0000	*	***0.0075***	0.0097	*	***0.0069***	0.0120	*	R	R		***0.0072***	0.0000	*	***0.0072***	0	*
Calcium	µg/m[3]	--	--	--	--	--	--	1.2470	2.4530		1.5930	3.0040		0.6822	2.4150		R	R		0.7543	3.2740		0.4661	1.834	
Chlorine	µg/m[3]	--	--	--	--	--	--	0.0124	0.0244		0.0087	0.0000	*	0.0069	0.0000	*	R	R		0.0087	0.0035	*	0.0129	0.0443	*
Chromium	µg/m[3]	100	0.000158	--	0.00016	--	--	**0.0017**	0.0034		**0.0027**	0.0051		***0.0012***	0.0000	*	R	R		**0.0015**	0.0065		***0.0012***	0.0009	*
Cobalt	µg/m[3]	10,000	0.000686	--	0.00069	--	--	***0.0216***	0.0000	*	***0.0351***	0.0000	*	***0.0153***	0.0000	*	R	R		***0.0186***	0.0000	*	***0.0132***	0	*
Copper	µg/m[3]	--	--	--	--	--	100	0.1787	0.3516		0.4490	0.8465		0.4560	1.6140		R	R		0.4934	2.1410		0.5452	2.145	
Gallium	µg/m[3]	--	--	--	--	--	--	0.0012	0.0000	*	0.0012	0.0000	*	0.0012	0.0000	*	R	R		0.0015	0.0000	*	0.0021	0	*
Germanium	µg/m[3]	--	--	--	--	--	--	0.0012	0.0000	*	0.0009	0.0000	*	0.0009	0.0000	*	R	R		0.0009	0.0000	*	0.0009	0	*
Indium	µg/m[3]	--	--	--	--	--	--	0.0063	0.0000	*	0.0078	0.0000	*	0.0072	0.0153	*	R	R		0.0078	0.0086	*	0.0075	0	*
Iron	µg/m[3]	--	--	--	--	--	--	1.1700	2.3010		1.9110	3.6020		0.8240	2.9170		R	R		1.0040	4.3570		0.7006	2.756	
Lanthanum	µg/m[3]	--	--	--	--	--	--	0.0267	0.0000	*	0.0249	0.0013	*	0.0117	0.0000	*	R	R		0.0123	0.0033	*	0.0075	0	*
Lead	µg/m[3]	--	--	1.5 [9 10]	--	1.5 [9 10]	--	0.0049	0.0096		0.0420	0.0792		0.0538	0.1905		R	R		0.0944	0.4095		0.1487	0.5852	
Magnesium	µg/m[3]	--	--	--	--	--	--	0.2029	0.3992		0.3624	0.6833		0.1098	0.3887		R	R		0.1516	0.6578		0.0318	0.0811	*
Manganese	µg/m[3]	2,500	0.0521	--	0.051	--	--	0.0183	0.0360		0.0356	0.0671		0.0144	0.0508		R	R		0.0134	0.0582		0.0071	0.0278	
Mercury	µg/m[3]	1,000	0.313	--	0.31	--	1.8	0.0024	0.0000	*	0.0018	0.0000	*	0.0018	0.0000	*	R	R		0.0018	0.0000	*	0.0018	0	*
Molybdenum	µg/m[3]	--	--	--	--	--	--	0.0052	0.0102		0.0106	0.0201		0.0073	0.0260		R	R		0.0043	0.0188		0.0083	0.0326	
Nickel	µg/m[3]	5,000	0.0079	--	0.008	--	6	0.0024	0.0014	*	0.0021	0.0039		0.0015	0.0047	*	R	R		0.0018	0.0039	*	0.0018	0.0015	*
Palladium	µg/m[3]	--	--	--	--	--	--	0.0054	0.0000	*	0.0066	0.0028	*	0.006	0.0000	*	R	R		0.0066	0.0061	*	0.0066	0.008	*
Phosphorus	µg/m[3]	--	--	--	--	--	--	0.0063	0.0000	*	0.0075	0.0000	*	0.0048	0.0000	*	R	R		0.0054	0.0000	*	0.0057	0	*
Potassium	µg/m[3]	--	--	--	--	--	--	1.0520	2.0690		1.1940	2.2500		0.3390	1.2000		R	R		0.3743	1.6240		0.5316	2.091	
Rubidium	µg/m[3]	--	--	--	--	--	--	0.0046	0.0091		0.0053	0.0100		0.0023	0.0080		R	R		0.0020	0.0086		0.0024	0.0094	
Selenium	µg/m[3]	500	18.3	--	--	--	--	0.0009	0.0011	*	0.0015	0.0028		0.0154	0.0547		R	R		0.0126	0.0546		0.0061	0.0239	
Silicon	µg/m[3]	--	--	--	--	--	--	4.1660	8.1950		5.8520	11.0300		2.1540	7.6230		R	R		2.0280	8.8010		2.5870	10.18	
Silver	µg/m[3]	--	--	--	--	--	--	0.0057	0.0000	*	0.0069	0.0012	*	0.0063	0.0005	*	R	R		0.0069	0.0018	*	0.0069	0.0074	*
Sodium	µg/m[3]	--	--	--	--	--	--	0.1905	0.1638	*	0.2691	0.2497	*	0.1806	0.3752	*	R	R		0.2080	0.9028		0.2022	0.6782	*
Strontium	µg/m[3]	--	--	--	--	--	--	0.0072	0.0141		0.0086	0.0162		0.0030	0.0107		R	R		0.0047	0.0202		0.0027	0.0106	
Sulfur	µg/m[3]	--	--	--	--	--	--	0.7467	1.4690		0.9652	1.8200		0.6691	2.3680		R	R		0.8489	3.6840		1.3640	5.365	
Tin	µg/m[3]	--	--	--	--	--	--	0.0078	0.0059	*	0.0087	0.0020	*	0.0078	0.0000	*	R	R		0.0084	0.0053	*	0.0084	0.0076	*
Titanium	µg/m[3]	--	--	--	31	--	--	0.1313	0.2582		0.2292	0.4320		0.0971	0.3437		R	R		0.1034	0.4489		0.0445	0.1752	
Vanadium	µg/m[3]	--	--	--	--	--	--	0.0051	0.0000	*	0.0078	0.0026	*	0.0036	0.0003	*	R	R		0.0036	0.0006	*	0.0021	0	*
Yttrium	µg/m[3]	--	--	--	--	--	--	0.0019	0.0038		0.0013	0.0024		0.0012	0.0000	*	R	R		0.0015	0.0000	*	0.0018	0	*
Zinc	µg/m[3]	--	--	--	--	--	--	0.0114	0.0225		0.0319	0.0601		0.0345	0.1220		R	R		0.0611	0.2650		0.0454	0.1786	
Zirconium	µg/m[3]	--	--	--	--	--	--	0.0042	0.0082		0.0050	0.0095		0.0016	0.0057		R	R		0.0015	0.0057	*	0.0017	0.0069	

Table Notes:

[1] Arizona Department of Environmental Quality Acute and Chronic Ambient Air Concentrations, Title 18 Chapter 2 Article 17, December 200
[2] Arizona Department of Environmental Quality Ambient Air Quality Standards, Title 18 Chapter 2 Article 2, December 200
[3] EPA Region IX Preliminary Remediation Goals, Ambient Air, October 200
[4] EPA National Ambient Air Quality Standards, http://www.epa.gov/air/criteria.html, February 200
[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] Samples are anticipated to be rejected by EPA during validation.
[12] Percent of Total Mass
[13] Precipitation measurements are recorded manually by a Hayden-Winkelman High School employee; reliability cannot be verifie
[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 due to sample volume issues with the instrument.
[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

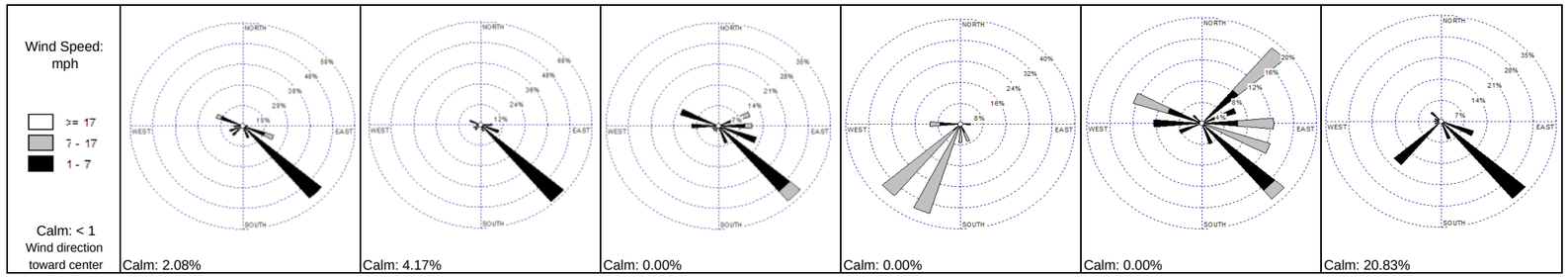

TABLE 1
Air Filter Sampling Laboratory Values for Inorganic Parameters
Hayden Monitoring Station
Data Evaluation Report
ASARCO LLC Hayden, Arizona Plant Site

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]	1/18/2008			2/17/2008			02/23/08			02/29/08			03/06/08			03/12/08		
Avg Wind Speed mph):								3.73			2.67			4.23			2.98			5.47			2.73		
Avg Wind Direction (degrees):								104			259			272			141			311			126		
Avg Ambient Temperature (ºC):								6.3			8.8			13.9			17.4			12.4			10.3		
Avg Ambient Relative Humidity (%):								10.6			31.7			17.0			11.5			7.9			9.5		
Precipitation (inches)[7]:								NA			NA			NA			NA			NA			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/m^3	--	--	150 [7]/50 [8]	--	150 [7]	--	18.26	NA		11.11	NA		8.32	NA		19.6	NA		13.64	NA		19.29	NA	
Aluminum	µg/m^3	--	--	--	5.1	--	--	0.6403	3.533		0.2615	2.395		0.1888	2.3480		0.4414	2.3590		0.2371	1.7900		0.6544	3.4770	
Antimony	µg/m^3	13,000	1.46	--	--	--	--	0.009	0.0031	*	0.0084	0	*	0.0024	0.0000	*	0.0033	0.0078	*	0.0036	0.0178	*	0.0060	0.0188	*
Arsenic	µg/m^3	2,500	0.000441	--	0.00045	--	0.19	**0.0153**	0.0844		**0.0063**	0.0574		**0.0033**	0.0416		**0.0221**	0.1183		**0.0212**	0.1599		**0.0079**	0.0418	
Barium	µg/m^3	--	--	--	0.52	--	--	0.0063	0	*	0.0048	0.003	*	0.0045	0.0059	*	0.0066	0.0000	*	0.0051	0.0000	*	0.0114	0.0000	*
Bismuth	µg/m^3	--	--	--	--	--	--	0.0153	0.0842		NA	NA		NA	NA		0.0157	0.0841		0.0200	0.1510		NA	NA	
Bromine	µg/m^3	--	--	--	--	--	--	0.0009	0.0018	*	0.0019	0.0173		0.0010	0.0129		0.0022	0.0118		0.0012	0.0021	*	0.0038	0.0200	
Cadmium	µg/m^3	250	0.00105	--	0.0011	--	--	***0.0072***	0.0094	*	***0.0066***	0.0358	*	0.0018	0.0000	*	0.0024	0.0053	*	0.0024	0.0000	*	0.0042	0.0000	*
Calcium	µg/m^3	--	--	--	--	--	--	0.4329	2.389		0.2391	2.191		0.2096	2.6060		0.3920	2.0950		0.3372	2.5450		0.4078	2.1660	
Chlorine	µg/m^3	--	--	--	--	--	--	0.0072	0.0255	*	0.006	0.0147	*	0.2038	2.5340		0.0251	0.1341		0.0336	0.2537		0.0194	0.1030	
Chromium	µg/m^3	100	0.000158	--	0.00016	--	--	**0.0023**	0.0125		***0.0012***	0	*	0.0009	0.0000	*	0.0009	0.0000	*	0.0009	0.0000	*	***0.0021***	0.0077	*
Cobalt	µg/m^3	10,000	0.000686	--	0.00069	--	--	***0.012***	0	*	***0.0057***	0	*	0.0039	0.0000	*	0.0090	0.0000	*	0.0057	0.0000	*	0.0123	0.0000	*
Copper	µg/m^3	--	--	--	--	--	100	0.3645	2.011		0.0846	0.775		0.0311	0.3870		0.2182	1.1660		0.5509	4.1580		0.2704	1.4370	
Gallium	µg/m^3	--	--	--	--	--	--	0.0015	0	*	0.0012	0	*	0.0012	0.0000	*	0.0018	0.0000	*	0.0018	0.0000	*	0.0027	0.0000	*
Germanium	µg/m^3	--	--	--	--	--	--	0.0009	0	*	0.0009	0	*	0.0009	0.0029	*	0.0012	0.0000	*	0.0012	0.0000	*	0.0024	0.0041	*
Indium	µg/m^3	--	--	--	--	--	--	0.0075	0	*	0.0072	0	*	0.0021	0.0035	*	0.0024	0.0000	*	0.0027	0.0092	*	0.0048	0.0012	*
Iron	µg/m^3	--	--	--	--	--	--	0.6352	3.504		0.2685	2.46		0.1528	1.9000		0.4591	2.4540		0.2694	2.0330		0.5798	3.0800	
Lanthanum	µg/m^3	--	--	--	--	--	--	0.0069	0	*	0.0051	0.0142	*	0.0069	0.0000	*	0.0105	0.0116	*	0.0078	0.0032	*	0.0186	0.0000	*
Lead	µg/m^3	--	--	1.5 [9 10]	--	1.5 [9 10]	--	0.0613	0.3385		0.0291	0.2665		0.0081	0.1013		0.0764	0.4082		0.0697	0.5263		0.0182	0.0965	
Magnesium	µg/m^3	--	--	--	--	--	--	0.051	0.2509	*	0.0405	0.3554	*	0.0613	0.7617		0.0653	0.3491		0.0591	0.4463		0.1138	0.6044	
Manganese	µg/m^3	2,500	0.0521	--	0.051	--	--	0.0059	0.0325		0.0038	0.0349		0.0025	0.0316		0.0052	0.0277		0.0027	0.0203		0.0064	0.0341	
Mercury	µg/m^3	1,000	0.313	--	0.31	--	1.8	0.0018	0	*	0.0018	0	*	0.0024	0.0064	*	0.0024	0.0000	*	0.0024	0.0000	*	0.0051	0.0000	*
Molybdenum	µg/m^3	--	--	--	--	--	--	0.0062	0.0343		0.0021	0.0091	*	0.0027	0.0000	*	0.0055	0.0292		0.0052	0.0394		0.0066	0.0065	*
Nickel	µg/m^3	5,000	0.0079	--	0.008	--	6	0.0018	0	*	0.0015	0.0108	*	0.0021	0.0023	*	0.0024	0.0000	*	0.0024	0.0000	*	0.0051	0.0171	*
Palladium	µg/m^3	--	--	--	--	--	--	0.0063	0.0013	*	0.006	0	*	0.0018	0.0000	*	0.0024	0.0000	*	0.0024	0.0000	*	0.0039	0.0000	*
Phosphorus	µg/m^3	--	--	--	--	--	--	0.0042	0	*	0.0039	0	*	0.0033	0.0000	*	0.0042	0.0000	*	0.0039	0.0000	*	0.0075	0.0000	*
Potassium	µg/m^3	--	--	--	--	--	--	0.3384	1.867		0.1419	1.3		0.0928	1.1530		0.2069	1.1060		0.1166	0.8798		0.2961	1.5730	
Rubidium	µg/m^3	--	--	--	--	--	--	0.0014	0.0075		0.0006	0.0026	*	0.0009	0.0000	*	0.0017	0.0091		0.0016	0.0124		0.0024	0.0029	*
Selenium	µg/m^3	500	18.3	--	--	--	--	0.0051	0.0283		0.0046	0.0418		0.0017	0.0211		0.0040	0.0216		0.0147	0.1109		0.0021	0.0000	*
Silicon	µg/m^3	--	--	--	--	--	--	1.6950	9.352		0.7218	6.612		0.4939	6.1420		1.1840	6.3300		0.6686	5.0460		1.7050	9.0580	
Silver	µg/m^3	--	--	--	--	--	--	0.0066	0	*	0.0063	0.0121	*	0.0018	0.0082	*	0.0024	0.0023	*	0.0052	0.0394		0.0042	0.0188	*
Sodium	µg/m^3	--	--	--	--	--	--	0.1689	0.6741	*	0.138	0.9096	*	0.2191	2.7240		0.1428	0.7540	*	0.1248	0.7160	*	0.2214	0.5568	*
Strontium	µg/m^3	--	--	--	--	--	--	0.0023	0.0125		0.0020	0.0181		0.0012	0.0070	*	0.0022	0.0118		0.0032	0.0242		0.0038	0.0200	
Sulfur	µg/m^3	--	--	--	--	--	--	0.4953	2.733		0.5010	4.589		0.1709	2.1250		0.6884	3.6790		0.3192	2.4090		0.3418	1.8160	
Tin	µg/m^3	--	--	--	--	--	--	0.0081	0.0153	*	0.0078	0	*	0.0027	0.0000	*	0.0036	0.0070	*	0.0036	0.0103	*	0.0066	0.0082	*
Titanium	µg/m^3	--	--	--	31	--	--	0.0396	0.2187		0.0267	0.2445		0.0149	0.1856		0.0315	0.1684		0.0179	0.1350		0.0434	0.2307	
Vanadium	µg/m^3	--	--	--	--	--	--	0.0018	0	*	0.0012	0	*	0.0009	0.0000	*	0.0018	0.0000	*	0.0012	0.0000	*	0.0027	0.0000	*
Yttrium	µg/m^3	--	--	--	--	--	--	0.0012	0	*	0.0012	0	*	0.0015	0.0000	*	0.0021	0.0000	*	0.0018	0.0000	*	0.0036	0.0012	*
Zinc	µg/m^3	--	--	--	--	--	--	0.0422	0.233		0.0209	0.1915		0.0086	0.1071		0.0683	0.3652		0.0414	0.3123		0.0195	0.1036	
Zirconium	µg/m^3	--	--	--	--	--	--	0.0015	0.0016	*	0.0012	0.0004	*	0.0021	0.0094	*	0.0024	0.0000	*	0.0021	0.0036	*	0.0048	0.0171	*

Table Notes:

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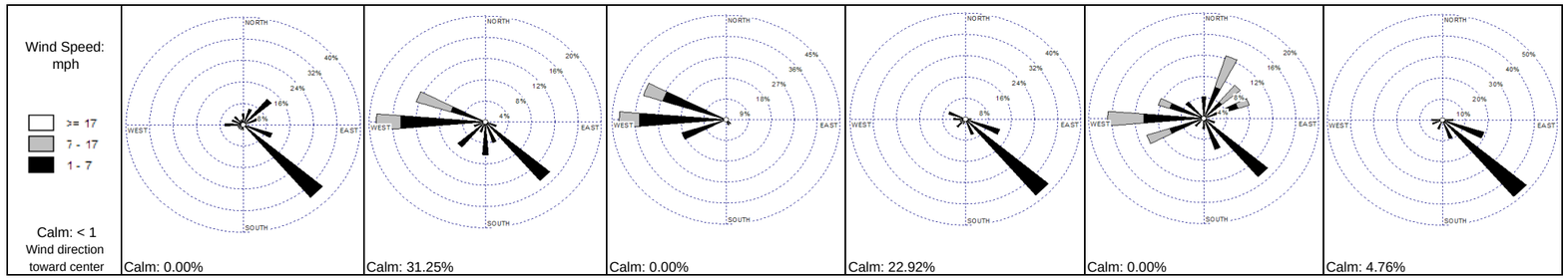

TABLE 1
Air Filter Sampling Laboratory Values for Inorganic Parameters
Hayden Monitoring Station
Data Evaluation Report
ASARCO LLC Hayden, Arizona Plant Site

Date:								03/14/08			03/20/08			03/26/08			03/30/08			04/02/08 [11]			04/05/08		
Avg Wind Speed mph):								NV			3.73			3.11			5.84			3.98			4.78		
Avg Wind Direction (degrees):								NV			203			256			242			252			230		
Avg Ambient Temperature (ºC):								NV			16.4			19.2			20.1			20.0			18.1		
Avg Ambient Relative Humidity (%):								NV			7.6			6.9			7.0			6.8			7.1		
Precipitation (inches)[7]:								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/m^3	--	--	150 [7]/50 [8]	--	150 [7]	--	NV	NV		29.53	NA		28.67	NA		1.16	NA		R	NA		29.05	NA	
Aluminum	µg/m^3	--	--	--	5.1	--	--	NV	NV		1.1140	3.9510		0.7213	2.6590		0.0105	0.9475	*	R	R		0.8409	3.0760	
Antimony	µg/m^3	13,000	1.46	--	--	--	--	NV	NV		0.0027	0.0022	*	0.0027	0.0045	*	0.0024	0.0000	*	R	R		0.0027	0.0014	*
Arsenic	µg/m^3	2,500	0.000441	--	0.00045	--	0.19	NV	NV		**0.0039**	0.0139		***0.0027***	0.0078	*	0.0009	0.0304	*	R	R		**0.0203**	0.0742	
Barium	µg/m^3	--	--	--	0.52	--	--	NV	NV		0.0102	0.0159	*	0.0078	0.0036	*	0.0033	0.2825	*	R	R		0.0087	0.0238	*
Bismuth	µg/m^3	--	--	--	--	--	--	NV	NV		NA	NA		NA	NA		NA	NA		R	R		NA	NA	
Bromine	µg/m^3	--	--	--	--	--	--	NV	NV		0.0031	0.0108		0.0056	0.0208		0.0006	0.0043	*	R	R		0.0027	0.0100	
Cadmium	µg/m^3	250	0.00105	--	0.0011	--	--	NV	NV		0.0021	0.0012	*	0.0018	0.0000	*	0.0018	0.0000	*	R	R		0.0018	0.0045	*
Calcium	µg/m^3	--	--	--	--	--	--	NV	NV		1.1700	4.1490		0.8178	3.0150		0.0129	1.1860		R	R		0.6126	2.2410	
Chlorine	µg/m^3	--	--	--	--	--	--	NV	NV		0.0309	0.1097		0.0790	0.2913		0.0036	0.1782	*	R	R		0.3658	1.3380	
Chromium	µg/m^3	100	0.000158	--	0.00016	--	--	NV	NV		***0.0012***	0.0022	*	**0.0017**	0.0064		0.0009	0.0000	*	R	R		***0.0009***	0.0019	*
Cobalt	µg/m^3	10,000	0.000686	--	0.00069	--	--	NV	NV		0.0156	0.0000	*	0.0126	0.0000	*	0.0024	0.0000	*	R	R		0.0093	0.0000	*
Copper	µg/m^3	--	--	--	--	--	100	NV	NV		0.2691	0.9541		0.2024	0.7460		0.0045	0.4129		R	R		0.2953	1.0800	
Gallium	µg/m^3	--	--	--	--	--	--	NV	NV		0.0012	0.0000	*	0.0012	0.0000	*	0.0012	0.0478	*	R	R		0.0015	0.0000	*
Germanium	µg/m^3	--	--	--	--	--	--	NV	NV		0.0012	0.0000	*	0.0009	0.0000	*	0.0009	0.0000	*	R	R		0.0012	0.0000	*
Indium	µg/m^3	--	--	--	--	--	--	NV	NV		0.0021	0.0000	*	0.0021	0.0000	*	0.0018	0.0261	*	R	R		0.0021	0.0000	*
Iron	µg/m^3	--	--	--	--	--	--	NV	NV		0.8418	2.9840		0.6822	2.5150		0.0087	0.7997		R	R		0.7091	2.5940	
Lanthanum	µg/m^3	--	--	--	--	--	--	NV	NV		0.0171	0.0057	*	0.0132	0.0134	*	0.0030	0.1652	*	R	R		0.0072	0.0000	*
Lead	µg/m^3	--	--	1.5 [9 10]	--	1.5 [9 10]	--	NV	NV		0.0152	0.0539		0.0125	0.0460		0.0024	0.0043	*	R	R		0.0305	0.1116	
Magnesium	µg/m^3	--	--	--	--	--	--	NV	NV		0.3135	1.1110		0.2193	0.8084		0.0117	0.4042	*	R	R		0.1943	0.7109	
Manganese	µg/m^3	2,500	0.0521	--	0.051	--	--	NV	NV		0.0134	0.0474		0.0103	0.0380		0.0012	0.0000	*	R	R		0.0091	0.0332	
Mercury	µg/m^3	1,000	0.313	--	0.31	--	1.8	NV	NV		0.0024	0.0000	*	0.0021	0.0000	*	0.0021	0.0391	*	R	R		0.0024	0.0041	*
Molybdenum	µg/m^3	--	--	--	--	--	--	NV	NV		0.0049	0.0174		0.0032	0.0120		0.0027	0.0000	*	R	R		0.0078	0.0286	
Nickel	µg/m^3	5,000	0.0079	--	0.008	--	6	NV	NV		0.0024	0.0007	*	0.0021	0.0000	*	0.0021	0.0087	*	R	R		0.0024	0.0010	*
Palladium	µg/m^3	--	--	--	--	--	--	NV	NV		0.0018	0.0000	*	0.0018	0.0000	*	0.0018	0.0000	*	R	R		0.0021	0.0000	*
Phosphorus	µg/m^3	--	--	--	--	--	--	NV	NV		0.0057	0.0000	*	0.0048	0.0000	*	0.0024	0.0000	*	R	R		0.0045	0.0000	*
Potassium	µg/m^3	--	--	--	--	--	--	NV	NV		0.4226	1.4980		0.2662	0.9812		0.0034	0.3173		R	R		0.3865	1.4140	
Rubidium	µg/m^3	--	--	--	--	--	--	NV	NV		0.0020	0.0072		0.0012	0.0028	*	0.0009	0.0217	*	R	R		0.0015	0.0053	
Selenium	µg/m^3	500	18.3	--	--	--	--	NV	NV		0.0009	0.0008	*	0.0009	0.0000	*	0.0009	0.0043	*	R	R		0.0081	0.0296	
Silicon	µg/m^3	--	--	--	--	--	--	NV	NV		3.4400	12.1900		1.9060	7.0280		0.0186	1.7170		R	R		2.17	7.9390	
Silver	µg/m^3	--	--	--	--	--	--	NV	NV		0.0021	0.0025	*	0.0018	0.0000	*	0.0018	0.0000	*	R	R		0.0021	0.0000	*
Sodium	µg/m^3	--	--	--	--	--	--	NV	NV		0.1641	0.3443	*	0.1500	0.4034	*	0.0300	1.5780	*	R	R		0.4395	1.6080	
Strontium	µg/m^3	--	--	--	--	--	--	NV	NV		0.0050	0.0177		0.0041	0.0153		0.0012	0.0391	*	R	R		0.0043	0.0157	
Sulfur	µg/m^3	--	--	--	--	--	--	NV	NV		0.6884	2.4400		0.5090	1.8760		0.0018	0.0956	*	R	R		0.7279	2.6630	
Tin	µg/m^3	--	--	--	--	--	--	NV	NV		0.0027	0.0000	*	0.0030	0.0062	*	0.0027	0.0000	*	R	R		0.0024	0.0000	*
Titanium	µg/m^3	--	--	--	31	--	--	NV	NV		0.0787	0.2789		0.0547	0.2015		0.0009	0.0000	*	R	R		0.0636	0.2327	
Vanadium	µg/m^3	--	--	--	--	--	--	NV	NV		0.0030	0.0015	*	0.0024	0.0010	*	0.0006	0.0000	*	R	R		0.0024	0.0031	*
Yttrium	µg/m^3	--	--	--	--	--	--	NV	NV		0.0015	0.0000	*	0.0015	0.0000	*	0.0015	0.0304	*	R	R		0.0027	0.0000	*
Zinc	µg/m^3	--	--	--	--	--	--	NV	NV		0.0147	0.0522		0.0144	0.0529		0.0015	0.0000	*	R	R		0.0232	0.0849	
Zirconium	µg/m^3	--	--	--	--	--	--	NV	NV		0.0021	0.0072	*	0.0018	0.0012	*	0.0018	0.0000	*	R	R		0.0021	0.0041	*

Table Notes:

[1] Arizona Department of Environmental Quality Acute and Chronic Ambient Air Concentrations, Title 18 Chapter 2 Article 17, December 200
[2] Arizona Department of Environmental Quality Ambient Air Quality Standards, Title 18 Chapter 2 Article 2, December 200
[3] EPA Region IX Preliminary Remediation Goals, Ambient Air, October 200
[4] EPA National Ambient Air Quality Standards, http://www.epa.gov/air/criteria.html, February 200
[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] Samples are anticipated to be rejected by EPA during validation.
[12] Percent of Total Mass
[13] Precipitation measurements are recorded manually by a Hayden-Winkelman High School employee; reliability cannot be verifie
[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 due to sample volume issues with the instrument.
[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

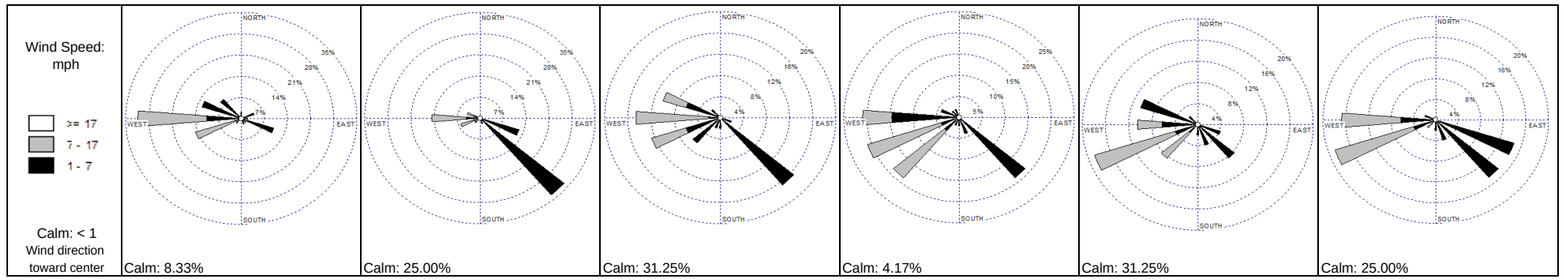

TABLE 1
Air Filter Sampling Laboratory Values for Inorganic Parameters
Hayden Monitoring Station
Data Evaluation Report
ASARCO LLC Hayden, Arizona Plant Site

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]	04/12/08			04/15/08			04/18/08			04/21/08			04/24/08			05/10/08		
Avg Wind Speed mph):								7.95			5.53			4.41			3.85			5.03			3.67		
Avg Wind Direction (degrees):								44			236			138			267			251			244		
Avg Ambient Temperature (ºC):								21.4			23.5			19.3			19.5			21.2			24.4		
Avg Ambient Relative Humidity (%):								6.6			6.4			6.9			6.8			6.7			6.3		
Precipitation (inches)[7]:								NA			NA			NA			NA			NA			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/m^3	--	--	150 [7]/50 [8]	--	150 [7]	--	29.12	NA		33.35	NA		44.78	NA		26.71	NA		24.15	NA		R	NA	
Aluminum	µg/m^3	--	--	--	5.1	--	--	0.8357	3.0440		1.037	3.3550		1.649	3.8990		0.71	2.8210		0.9501	4.2000		R	R	
Antimony	µg/m^3	13,000	1.46	--	--	--	--	0.0055	0.0199		0.0027	0.0020	*	0.003	0.0050	*	0.0027	0.0054	*	0.0027	0.0046	*	R	R	
Arsenic	µg/m^3	2,500	0.000441	--	0.00045	--	0.19	**0.0970**	0.3532		**0.0120**	0.0388		**0.0227**	0.0538		**0.0067**	0.0268		**0.0050**	0.0223		R	R	
Barium	µg/m^3	--	--	--	0.52	--	--	0.0489	0.1782		0.0126	0.0201	*	0.0165	0.0257	*	0.0072	0.0245	*	0.0084	0.0343	*	R	R	
Bismuth	µg/m^3	--	--	--	--	--	--	0.0898	0.3272		0.0101	0.0326		0.0308	0.0728		NA	NA		NA	NA		NA	NA	
Bromine	µg/m^3	--	--	--	--	--	--	0.003	0.0000	*	0.0023	0.0073		0.005	0.0119		0.0057	0.0228		0.0031	0.0137		R	R	
Cadmium	µg/m^3	250	0.00105	--	0.0011	--	--	**0.0052**	0.0189		0.0018	0.0008	*	0.0021	0.0023	*	0.0018	0.0000	*	0.0018	0.0000	*	R	R	
Calcium	µg/m^3	--	--	--	--	--	--	0.8051	2.9320		0.8023	2.5950		1.329	3.1420		0.6286	2.4980		0.6959	3.0760		R	R	
Chlorine	µg/m^3	--	--	--	--	--	--	0.0159	0.0099	*	0.0436	0.1412		0.0497	0.1176		0.4722	1.8760		0.0359	0.1586		R	R	
Chromium	µg/m^3	100	0.000158	--	0.00016	--	--	**0.0071**	0.0259		0.0009	0.0000	*	***0.0015***	0.0022	*	***0.0009***	0.0021	*	**0.0010**	0.0046		R	R	
Cobalt	µg/m^3	10,000	0.000686	--	0.00069	--	--	0.0201	0.0000	*	0.0117	0.0000	*	0.0162	0.0000	*	0.0075	0.0000	*	0.0081	0.0000	*	R	R	
Copper	µg/m^3	--	--	--	--	--	100	2.055	7.4830		0.2266	0.7330		0.3633	0.8591		0.1761	0.6999		0.1012	0.4472		R	R	
Gallium	µg/m^3	--	--	--	--	--	--	0.0048	0.0000	*	0.0015	0.0000	*	0.0021	0.0000	*	0.0015	0.0000	*	0.0012	0.0000	*	R	R	
Germanium	µg/m^3	--	--	--	--	--	--	0.0015	0.0000	*	0.0012	0.0000	*	0.0012	0.0000	*	0.0012	0.0000	*	0.0009	0.0000	*	R	R	
Indium	µg/m^3	--	--	--	--	--	--	0.0021	0.0033	*	0.0018	0.0000	*	0.0021	0.0011	*	0.0018	0.0000	*	0.0018	0.0000	*	R	R	
Iron	µg/m^3	--	--	--	--	--	--	1.738	6.3310		0.9205	2.9770		1.281	3.0290		0.5871	2.3330		0.6177	2.7300		R	R	
Lanthanum	µg/m^3	--	--	--	--	--	--	0.0096	0.0000	*	0.0108	0.0000	*	0.0138	0.0000	*	0.006	0.0000	*	0.0069	0.0000	*	R	R	
Lead	µg/m^3	--	--	1.5 [9 10]	--	1.5 [9 10]	--	0.4627	1.6850		0.059	0.1908		0.1272	0.3007		0.0299	0.1190		0.0097	0.0427		R	R	
Magnesium	µg/m^3	--	--	--	--	--	--	0.0477	0.0899	*	0.2325	0.7522		0.3601	0.8515		0.195	0.7747		0.2333	1.0310		R	R	
Manganese	µg/m^3	2,500	0.0521	--	0.051	--	--	0.0125	0.0456		0.0147	0.0477		0.0244	0.0578		0.009	0.0357		0.0102	0.0450		R	R	
Mercury	µg/m^3	1,000	0.313	--	0.31	--	1.8	0.0024	0.0000	*	0.0024	0.0000	*	0.0024	0.0000	*	0.0021	0.0000	*	0.0021	0.0027	*	R	R	
Molybdenum	µg/m^3	--	--	--	--	--	--	0.0373	0.1358		0.003	0.0049	*	0.0081	0.0193		0.0037	0.0148		0.0027	0.0035	*	R	R	
Nickel	µg/m^3	5,000	0.0079	--	0.008	--	6	0.0027	0.0000	*	0.0024	0.0043	*	0.0024	0.0010	*	0.0021	0.0000	*	0.0021	0.0033	*	R	R	
Palladium	µg/m^3	--	--	--	--	--	--	0.0021	0.0000	*	0.0021	0.0000	*	0.0021	0.0000	*	0.0018	0.0000	*	0.0018	0.0000	*	R	R	
Phosphorus	µg/m^3	--	--	--	--	--	--	0.0054	0.0009	*	0.0048	0.0008	*	0.012	0.0073	*	0.0045	0.0028	*	0.0045	0.0000	*	R	R	
Potassium	µg/m^3	--	--	--	--	--	--	0.3486	1.2690		0.3535	1.1430		0.6262	1.4810		0.3218	1.2790		0.3729	1.6480		R	R	
Rubidium	µg/m^3	--	--	--	--	--	--	0.0032	0.0115		0.0015	0.0049		0.0027	0.0063		0.0009	0.0037	*	0.0011	0.0050		R	R	
Selenium	µg/m^3	500	18.3	--	--	--	--	0.0604	0.2198		0.0028	0.0091		0.0074	0.0175		0.0049	0.0195		0.0016	0.0073		R	R	
Silicon	µg/m^3	--	--	--	--	--	--	2.177	7.9270		2.826	9.1410		4.233	10.0100		1.682	6.6830		2.253	9.9600		R	R	
Silver	µg/m^3	--	--	--	--	--	--	0.0075	0.0274		0.0021	0.0003	*	0.0021	0.0011	*	0.0018	0.0000	*	0.0018	0.0000	*	R	R	
Sodium	µg/m^3	--	--	--	--	--	--	0.0843	0.0000	*	0.1926	0.2584	*	0.4872	0.5309	*	0.4539	1.8040		0.1785	0.6774	*	R	R	
Strontium	µg/m^3	--	--	--	--	--	--	0.0041	0.0149		0.0064	0.0206		0.0095	0.0225		0.0044	0.0176		0.0047	0.0206		R	R	
Sulfur	µg/m^3	--	--	--	--	--	--	1.706	6.2140		0.6756	2.1850		1.465	3.4650		0.8979	3.5680		0.5702	2.5200		R	R	
Tin	µg/m^3	--	--	--	--	--	--	0.003	0.0093	*	0.0024	0.0011	*	0.0024	0.0000	*	0.0024	0.0006	*	0.0024	0.0000	*	R	R	
Titanium	µg/m^3	--	--	--	31	--	--	0.0885	0.3222		0.1114	0.3602		0.1333	0.3152		0.0484	0.1923		0.0615	0.2718		R	R	
Vanadium	µg/m^3	--	--	--	--	--	--	0.0033	0.0070	*	0.0042	0.0119	*	0.0051	0.0107	*	0.0021	0.0051	*	0.0024	0.0062	*	R	R	
Yttrium	µg/m^3	--	--	--	--	--	--	0.0042	0.0000	*	0.0027	0.0000	*	0.003	0.0000	*	0.0024	0.0000	*	0.0024	0.0000	*	R	R	
Zinc	µg/m^3	--	--	--	--	--	--	0.2285	0.8322		0.0267	0.0863		0.0603	0.1425		0.0207	0.0821		0.011	0.0487		R	R	
Zirconium	µg/m^3	--	--	--	--	--	--	0.0045	0.0163		0.0043	0.0139		0.0025	0.0059		0.0018	0.0045	*	0.0018	0.0035	*	R	R	

Table Notes:

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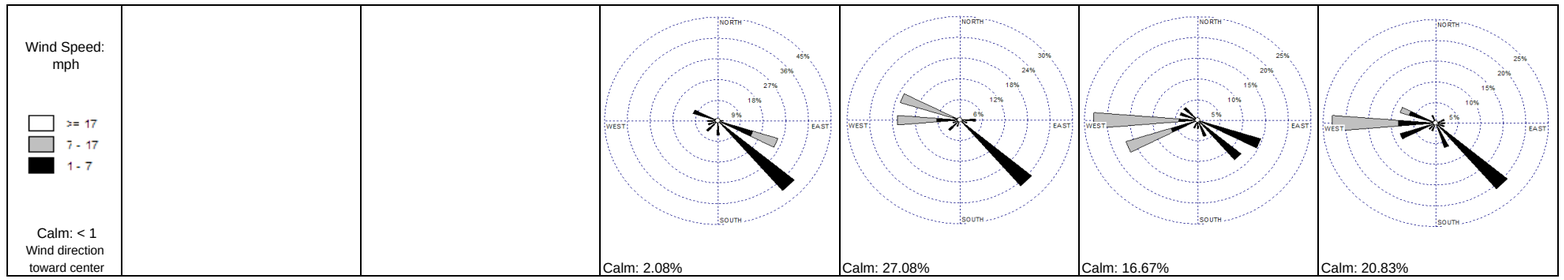

TABLE 1
Air Filter Sampling Laboratory Values for Inorganic Parameters
Hayden Monitoring Station
Data Evaluation Report
ASARCO LLC Hayden, Arizona Plant Site

Date:								05/13/08			05/16/08			05/19/08			05/22/08			05/28/08			05/31/08		
Avg Wind Speed mph):								5.03			8.57			5.72			7.46			4.91			4.04		
Avg Wind Direction (degrees):								304			52			260			229			274			261		
Avg Ambient Temperature (ºC):								18.6			24.9			31.0			20.0			24.9			26.7		
Avg Ambient Relative Humidity (%):								15.8			6.7			5.5			7.9			6.5			6.0		
Precipitation (inches)[7]:								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/m^3	--	--	150 [7]/50 [8]	--	150 [7]	--	40.06	NA		23.85	NA		32.67	NA		**93.75**	NA		R	NA		30	NA	
Aluminum	µg/m^3	--	--	--	5.1	--	--	1.389	3.6830		0.3975	1.7930		1.132	3.8310		3.686	4.2640		R	R		1.061	3.8470	
Antimony	µg/m^3	13,000	1.46	--	--	--	--	0.0027	0.0024	*	0.0037	0.0168		0.0024	0.0000	*	0.0054	0.0005	*	R	R		0.003	0.0000	*
Arsenic	µg/m^3	2,500	0.000441	--	0.00045	--	0.19	**0.0426**	0.1130		**0.0830**	0.3745		***0.0042***	0.0110	*	**0.0053**	0.0062		R	R		**0.007**	0.0254	
Barium	µg/m^3	--	--	--	0.52	--	--	0.0144	0.0330	*	0.0181	0.0816		0.0117	0.0193	*	0.036	0.0417		R	R		0.0099	0.0347	*
Bismuth	µg/m^3	--	--	--	--	--	--	0.0263	0.0697		0.083	0.3745		0.0073	0.0247		NA	NA		R	R		NA	NA	
Bromine	µg/m^3	--	--	--	--	--	--	0.0012	0.0021	*	0.0021	0.0000	*	0.0041	0.0139		0.0076	0.0088		R	R		0.0028	0.0101	
Cadmium	µg/m^3	250	0.00105	--	0.0011	--	--	0.0021	0.0015	*	**0.0060**	0.0270		0.0018	0.0000	*	0.0036	0.0009	*	R	R		***0.0024***	0.0000	*
Calcium	µg/m^3	--	--	--	--	--	--	1.09	2.8910		0.3476	1.5680		0.9939	3.3640		3.061	3.5410		R	R		0.6323	2.2920	
Chlorine	µg/m^3	--	--	--	--	--	--	0.2183	0.5790		0.0105	0.0000	*	0.0197	0.0666		2.112	2.4430		R	R		0.0233	0.0845	
Chromium	µg/m^3	100	0.000158	--	0.00016	--	--	***0.0012***	0.0027	*	**0.0009**	0.0040		***0.0009***	0.0033	*	**0.0031**	0.0036		R	R		**0.0019**	0.0068	
Cobalt	µg/m^3	10,000	0.000686	--	0.00069	--	--	0.0192	0.0000	*	0.0102	0.0000	*	0.0129	0.0000	*	0.0318	0.0000	*	R	R		***0.015***	0.0000	*
Copper	µg/m^3	--	--	--	--	--	100	0.6582	1.7460		1.39	6.2700		0.1416	0.4793		R	R		R	R		0.1489	0.5399	
Gallium	µg/m^3	--	--	--	--	--	--	0.0021	0.0000	*	0.0033	0.0000	*	0.0012	0.0000	*	0.0024	0.0000	*	R	R		0.0012	0.0000	*
Germanium	µg/m^3	--	--	--	--	--	--	0.0012	0.0000	*	0.0012	0.0000	*	0.0012	0.0000	*	0.0021	0.0004	*	R	R		0.0009	0.0000	*
Indium	µg/m^3	--	--	--	--	--	--	0.0021	0.0000	*	0.0018	0.0042	*	0.0018	0.0010	*	0.0036	0.0000	*	R	R		0.0024	0.0000	*
Iron	µg/m^3	--	--	--	--	--	--	1.55	4.1100		0.7999	3.6090		1.036	3.5080		2.589	2.9950		R	R		0.7966	2.8880	
Lanthanum	µg/m^3	--	--	--	--	--	--	0.012	0.0000	*	0.006	0.0000	*	0.0102	0.0000	*	0.0243	0.0000	*	R	R		0.0105	0.0000	*
Lead	µg/m^3	--	--	1.5 [9 10]	--	1.5 [9 10]	--	0.1163	0.3084		0.288	1.2990		0.0236	0.0798		0.0166	0.0192		R	R		0.028	0.1014	
Magnesium	µg/m^3	--	--	--	--	--	--	0.3979	1.0550		0.081	0.2434	*	0.4217	1.4280		0.9092	1.0520		R	R		0.0912	0.3308	
Manganese	µg/m^3	2,500	0.0521	--	0.051	--	--	0.021	0.0557		0.0053	0.0240		0.0153	0.0520		0.0493	0.0570		R	R		0.0109	0.0396	
Mercury	µg/m^3	1,000	0.313	--	0.31	--	1.8	0.0024	0.0000	*	0.0021	0.0000	*	0.0021	0.0000	*	0.0039	0.0009	*	R	R		0.0018	0.0000	*
Molybdenum	µg/m^3	--	--	--	--	--	--	0.0097	0.0257		0.0172	0.0777		0.0027	0.0041	*	0.0051	0.0025	*	R	R		0.0021	0.0063	*
Nickel	µg/m^3	5,000	0.0079	--	0.008	--	6	0.0024	0.0042	*	0.0024	0.0000	*	0.0021	0.0019	*	0.0042	0.0000	*	R	R		0.0018	0.0032	*
Palladium	µg/m^3	--	--	--	--	--	--	0.0021	0.0000	*	0.0018	0.0000	*	0.0018	0.0000	*	0.0039	0.0000	*	R	R		0.0024	0.0000	*
Phosphorus	µg/m^3	--	--	--	--	--	--	0.006	0.0136	*	0.0045	0.0000	*	0.0101	0.0343		0.0114	0.0043	*	R	R		0.0054	0.0000	*
Potassium	µg/m^3	--	--	--	--	--	--	0.6347	1.6830		0.1913	0.8632		0.442	1.4960		1.598	1.8480		R	R		0.597	2.1640	
Rubidium	µg/m^3	--	--	--	--	--	--	0.0035	0.0094		0.0029	0.0130		0.0024	0.0080		0.0087	0.0100		R	R		0.0018	0.0067	
Selenium	µg/m^3	500	18.3	--	--	--	--	0.0237	0.0628		0.0308	0.1389		0.0012	0.0041		0.0018	0.0014	*	R	R		0.0009	0.0015	*
Silicon	µg/m^3	--	--	--	--	--	--	3.23	8.5660		1.022	4.6110		2.657	8.9950		9.149	10.5800		R	R		3.114	11.2900	
Silver	µg/m^3	--	--	--	--	--	--	0.0021	0.0055	*	0.0027	0.0123		0.0018	0.0000	*	0.0036	0.0000	*	R	R		0.0024	0.0000	*
Sodium	µg/m^3	--	--	--	--	--	--	0.2867	0.7603		0.072	0.0000	*	0.1842	0.3019	*	1.71	1.9780		R	R		0.0609	0.1173	*
Strontium	µg/m^3	--	--	--	--	--	--	0.0085	0.0225		0.0024	0.0110		0.0066	0.0225		0.0287	0.0332		R	R		0.004	0.0145	
Sulfur	µg/m^3	--	--	--	--	--	--	1.359	3.6050		1.195	5.3910		0.7562	2.5600		1.184	1.3700		R	R		0.6592	2.3900	
Tin	µg/m^3	--	--	--	--	--	--	0.0027	0.0022	*	0.0027	0.0110	*	0.0024	0.0000	*	0.0051	0.0004	*	R	R		0.003	0.0000	*
Titanium	µg/m^3	--	--	--	31	--	--	0.1251	0.3319		0.0462	0.2084		0.1052	0.3561		0.2513	0.2907		R	R		0.0847	0.3069	
Vanadium	µg/m^3	--	--	--	--	--	--	0.0045	0.0097	*	0.0018	0.0034	*	0.0039	0.0107	*	0.01	0.0116		R	R		0.0033	0.0000	*
Yttrium	µg/m^3	--	--	--	--	--	--	0.003	0.0000	*	0.003	0.0017	*	0.0024	0.0000	*	0.0051	0.0000	*	R	R		0.0012	0.0027	*
Zinc	µg/m^3	--	--	--	--	--	--	0.0857	0.2274		0.219	0.9879		0.0174	0.0588		0.0212	0.0245		R	R		0.0222	0.0804	
Zirconium	µg/m^3	--	--	--	--	--	--	0.0022	0.0059		0.0028	0.0127		0.0023	0.0077		0.0073	0.0084		R	R		0.0018	0.0067	

Table Notes:

[1] Arizona Department of Environmental Quality Acute and Chronic Ambient Air Concentrations, Title 18 Chapter 2 Article 17, December 200
[2] Arizona Department of Environmental Quality Ambient Air Quality Standards, Title 18 Chapter 2 Article 2, December 200
[3] EPA Region IX Preliminary Remediation Goals, Ambient Air, October 200
[4] EPA National Ambient Air Quality Standards, http://www.epa.gov/air/criteria.html, February 200
[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] Samples are anticipated to be rejected by EPA during validation.
[12] Percent of Total Mass
[13] Precipitation measurements are recorded manually by a Hayden-Winkelman High School employee; reliability cannot be verifie
[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 due to sample volume issues with the instrument.
[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

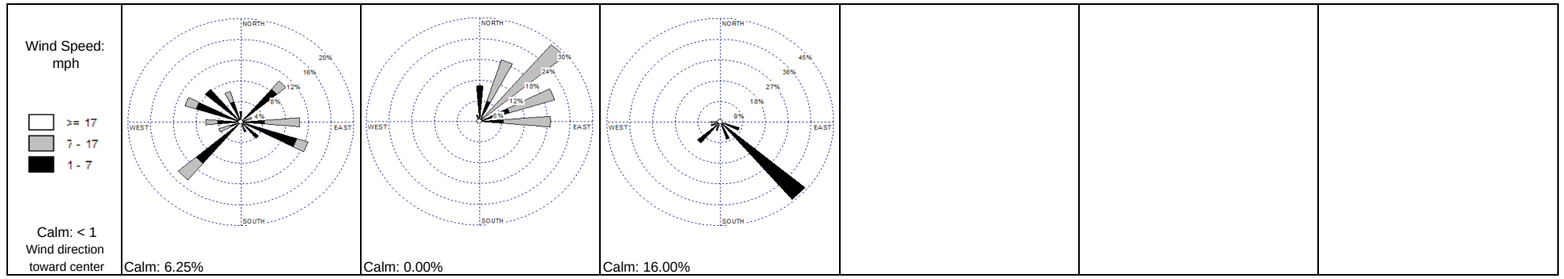

TABLE 1
Air Filter Sampling Laboratory Values for Inorganic Parameters
Hayden Monitoring Station
Data Evaluation Report
ASARCO LLC Hayden, Arizona Plant Site

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]	06/03/08			06/06/08			06/09/08			06/12/08			06/15/08			06/18/08		
Avg Wind Speed mph):								4.35			4.66			3.48			4.23			4.35			5.10		
Avg Wind Direction (degrees):								249			238			225			268			265			259		
Avg Ambient Temperature (ºC):								28.2			26.2			30.1			29.4			33.4			33.9		
Avg Ambient Relative Humidity (%):								5.8			6.1			5.6			5.7			5.2			5.2		
Precipitation (inches)[7]:								NA			NA			NA			NA			NA			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/m^3	--	--	150 [7]/50 [8]	--	150 [7]	--	33.15	NA		17.26	NA		R	NA		**53.37**	NA		**60.94**	NA		40.22	NA	
Aluminum	µg/m^3	--	--	--	5.1	--	--	1.29	4.2770		0.3854	2.4340		R	R		1.64	3.3760		1.953	3.5720		1.288	3.5650	
Antimony	µg/m^3	13,000	1.46	--	--	--	--	0.0027	0.0034	*	0.0024	0.0000	*	R	R		0.0033	0.0000	*	0.0033	0.0000	*	0.003	0.0000	*
Arsenic	µg/m^3	2,500	0.000441	--	0.00045	--	0.19	***0.0081***	0.0258	*	**0.0063**	0.0396		R	R		**0.0247**	0.0508		**0.0337**	0.0616		**0.0128**	0.0353	
Barium	µg/m^3	--	--	--	0.52	--	--	0.0142	0.0471		0.0051	0.0054	*	R	R		0.0213	0.0438		0.0276	0.0502	*	0.012	0.0331	
Bismuth	µg/m^3	--	--	--	--	--	--	0.0133	0.0440		NA	NA		R	R		0.0214	0.0440		0.0321	0.0587		NA	NA	
Bromine	µg/m^3	--	--	--	--	--	--	0.0036	0.0120		0.0013	0.0083		R	R		0.0037	0.0077		0.006	0.0109		0.0043	0.0119	
Cadmium	µg/m^3	250	0.00105	--	0.0011	--	--	0.0018	0.0011	*	0.0018	0.0006	*	R	R		***0.0027***	0.0022	*	**0.003**	0.0054		***0.0024***	0.0000	*
Calcium	µg/m^3	--	--	--	--	--	--	0.9078	3.0090		0.266	1.6800		R	R		1.55	3.1910		1.93	3.5310		1.088	3.0120	
Chlorine	µg/m^3	--	--	--	--	--	--	0.0895	0.2967		0.0154	0.0975		R	R		0.3989	0.8211		0.0983	0.1798		0.0963	0.2665	
Chromium	µg/m^3	100	0.000158	--	0.00016	--	--	***0.0009***	0.0027	*	0.0009	0.0015	*	R	R		**0.002**	0.0041		***0.0018***	0.0022	*	***0.0015***	0.0040	*
Cobalt	µg/m^3	10,000	0.000686	--	0.00069	--	--	0.0138	0.0000	*	0.0048	0.0000	*	R	R		***0.0291***	0.0000	*	***0.0435***	0.0000	*	***0.0207***	0.0000	*
Copper	µg/m^3	--	--	--	--	--	100	0.3412	1.1310		0.1273	0.8038		R	R		0.6408	1.3190		0.6917	1.2650		0.3725	1.0310	
Gallium	µg/m^3	--	--	--	--	--	--	0.0015	0.0000	*	0.0012	0.0000	*	R	R		0.0015	0.0000	*	0.0018	0.0000	*	0.0012	0.0000	*
Germanium	µg/m^3	--	--	--	--	--	--	0.0012	0.0000	*	0.0012	0.0000	*	R	R		0.0009	0.0000	*	0.0012	0.0000	*	0.0009	0.0000	*
Indium	µg/m^3	--	--	--	--	--	--	0.0021	0.0000	*	0.0018	0.0000	*	R	R		0.0027	0.0000	*	0.0027	0.0000	*	0.0027	0.0008	*
Iron	µg/m^3	--	--	--	--	--	--	1.106	3.6660		0.3049	1.9250		R	R		1.575	3.2420		2.381	4.3550		1.113	3.0810	
Lanthanum	µg/m^3	--	--	--	--	--	--	0.0099	0.0000	*	0.0045	0.0000	*	R	R		0.0165	0.0000	*	0.0297	0.0000	*	0.0117	0.0000	*
Lead	µg/m^3	--	--	1.5 [9 10]	--	1.5 [9 10]	--	0.0547	0.1812		0.0185	0.1166		R	R		0.0746	0.1536		0.1255	0.2295		0.033	0.0912	
Magnesium	µg/m^3	--	--	--	--	--	--	0.2324	0.7704		0.0712	0.4499		R	R		0.1663	0.3424		0.2462	0.4503		0.1477	0.4090	
Manganese	µg/m^3	2,500	0.0521	--	0.051	--	--	0.0164	0.0543		0.0038	0.0241		R	R		0.0255	0.0525		0.0319	0.0583		0.0189	0.0523	
Mercury	µg/m^3	1,000	0.313	--	0.31	--	1.8	0.0021	0.0000	*	0.0021	0.0000	*	R	R		0.0021	0.0000	*	0.0021	0.0000	*	0.0021	0.0000	*
Molybdenum	µg/m^3	--	--	--	--	--	--	0.0054	0.0179		0.0027	0.0089	*	R	R		0.0076	0.0157		0.0096	0.0175		0.0048	0.0134	
Nickel	µg/m^3	5,000	0.0079	--	0.008	--	6	0.0024	0.0041	*	0.0021	0.0000	*	R	R		0.0021	0.0003	*	0.0021	0.0000	*	0.0018	0.0014	*
Palladium	µg/m^3	--	--	--	--	--	--	0.0021	0.0000	*	0.0018	0.0006	*	R	R		0.0024	0.0000	*	0.0024	0.0000	*	0.0024	0.0000	*
Phosphorus	µg/m^3	--	--	--	--	--	--	0.0061	0.0201		0.0033	0.0000	*	R	R		0.0075	0.0000	*	0.0087	0.0000	*	0.0063	0.0000	*
Potassium	µg/m^3	--	--	--	--	--	--	0.6488	2.1510		0.1996	1.2610		R	R		0.816	1.6790		0.9153	1.6740		0.6629	1.8350	
Rubidium	µg/m^3	--	--	--	--	--	--	0.0028	0.0094		0.0009	0.0027	*	R	R		0.0042	0.0087		0.0044	0.0080		0.0022	0.0061	
Selenium	µg/m^3	500	18.3	--	--	--	--	0.0019	0.0062		0.0009	0.0027	*	R	R		0.0107	0.0220		0.0163	0.0299		0.0066	0.0182	
Silicon	µg/m^3	--	--	--	--	--	--	3.366	11.1600		1.06	6.6970		R	R		4.52	9.3040		6.154	11.2600		3.696	10.2300	
Silver	µg/m^3	--	--	--	--	--	--	0.0018	0.0000	*	0.0018	0.0006	*	R	R		0.0024	0.0000	*	0.0027	0.0029	*	0.0024	0.0005	*
Sodium	µg/m^3	--	--	--	--	--	--	0.2058	0.4277	*	0.045	0.0000	*	R	R		0.5801	1.1940		0.311	0.5689		0.2016	0.5581	
Strontium	µg/m^3	--	--	--	--	--	--	0.0059	0.0197		0.0018	0.0116		R	R		0.0116	0.0238		0.0137	0.0251		0.005	0.0139	
Sulfur	µg/m^3	--	--	--	--	--	--	0.9685	3.2110		0.3642	2.3000		R	R		1.173	2.4140		1.424	2.6050		1.011	2.8000	
Tin	µg/m^3	--	--	--	--	--	--	0.0024	0.0002	*	0.0024	0.0012	*	R	R		0.0033	0.0041	*	0.0033	0.0000	*	0.003	0.0034	*
Titanium	µg/m^3	--	--	--	31	--	--	0.1001	0.3320		0.0247	0.1561		R	R		0.1421	0.2925		0.2776	0.5079		0.0935	0.2588	
Vanadium	µg/m^3	--	--	--	--	--	--	0.0036	0.0103	*	0.0012	0.0003	*	R	R		0.0057	0.0000	*	0.0105	0.0000	*	0.0039	0.0000	*
Yttrium	µg/m^3	--	--	--	--	--	--	0.0027	0.0000	*	0.0024	0.0000	*	R	R		0.0012	0.0000	*	0.0015	0.0002	*	0.0012	0.0014	*
Zinc	µg/m^3	--	--	--	--	--	--	0.0347	0.1152		0.0153	0.0966		R	R		0.0638	0.1314		0.0676	0.1236		0.0258	0.0716	
Zirconium	µg/m^3	--	--	--	--	--	--	0.003	0.0100		0.0018	0.0059	*	R	R		0.0032	0.0065		0.0045	0.0082		0.0022	0.0061	

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[13] Precipitation measurements are recorded manually by a Hayden-Winkelman High School employee; reliability cannot be verifie
[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 due to sample volume issues with the instrument.
[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

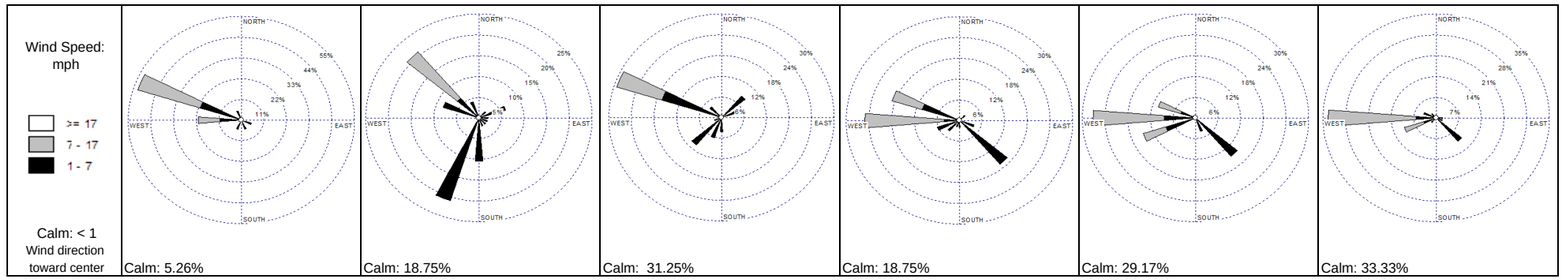

TABLE 1
Air Filter Sampling Laboratory Values for Inorganic Parameters
Hayden Monitoring Station
Data Evaluation Report
ASARCO LLC Hayden, Arizona Plant Site

Date:								06/21/08			07/09/08			07/12/08			07/15/08			07/18/08			07/21/08		
Avg Wind Speed mph):								6.09			6.21			3.67			4.41			5.47			4.35		
Avg Wind Direction (degrees):								146			96			206			245			261			127		
Avg Ambient Temperature (ºC):								34.5			29.6			28.6			30.3			33.2			29.0		
Avg Ambient Relative Humidity (%):								5.1			12.4			20.7			18.1			7.8			23.6		
Precipitation (inches)[7]:								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/m^3	--	--	150 [7]/50 [8]	--	150 [7]	--	**60.24**	NA		28.62	NA		12.91	NA		24.81	NA		32.8	NA		R	NA	
Aluminum	µg/m^3	--	--	--	5.1	--	--	2.001	3.7060		0.7105	2.7330		0.2522	2.1310		0.7458	3.3020		0.7835	2.7450		R	R	
Antimony	µg/m^3	13,000	1.46	--	--	--	--	0.0089	0.0166		0.003	0.0092	*	0.0027	0.0000	*	0.0027	0.0040	*	0.0027	0.0000	*	R	R	
Arsenic	µg/m^3	2,500	0.000441	--	0.00045	--	0.19	**0.0263**	0.0487		**0.017**	0.0652		***0.0021***	0.0171	*	**0.0073**	0.0321		**0.0122**	0.0429		R	R	
Barium	µg/m^3	--	--	--	0.52	--	--	0.0239	0.0443		0.0116	0.0447		0.0051	0.0203	*	0.0087	0.0186	*	0.0123	0.0180	*	R	R	
Bismuth	µg/m^3	--	--	--	--	--	--	0.032	0.0593		0.0607	0.2336		NA	NA		NA	NA		0.0113	0.0398		NA	NA	
Bromine	µg/m^3	--	--	--	--	--	--	0.0024	0.0044		0.0021	0.0000	*	0.0018	0.0151		0.0038	0.0169		0.0028	0.0097		R	R	
Cadmium	µg/m^3	250	0.00105	--	0.0011	--	--	***0.0027***	0.0021	*	***0.0021***	0.0072	*	***0.0018***	0.0000	*	***0.0018***	0.0021	*	***0.0018***	0.0000	*	R	R	
Calcium	µg/m^3	--	--	--	--	--	--	1.152	2.1340		0.5005	1.9250		0.2502	2.1140		0.5857	2.5940		0.8282	2.9020		R	R	
Chlorine	µg/m^3	--	--	--	--	--	--	0.0105	0.0000	*	0.012	0.0000	*	0.0051	0.0000	*	0.0063	0.0234	*	0.0066	0.0112	*	R	R	
Chromium	µg/m^3	100	0.000158	--	0.00016	--	--	**0.0022**	0.0041		**0.0019**	0.0072		***0.0009***	0.0000	*	***0.0009***	0.0033	*	***0.0009***	0.0000	*	R	R	
Cobalt	µg/m^3	10,000	0.000686	--	0.00069	--	--	***0.0318***	0.0000	*	***0.0141***	0.0000	*	***0.0045***	0.0000	*	***0.0093***	0.0000	*	***0.0126***	0.0000	*	R	R	
Copper	µg/m^3	--	--	--	--	--	100	1.126	2.0860		0.9327	3.5870		0.0743	0.6275		0.276	1.2220		0.3863	1.3540		R	R	
Gallium	µg/m^3	--	--	--	--	--	--	0.0018	0.0000	*	0.0039	0.0000	*	0.0012	0.0000	*	0.0015	0.0000	*	0.0015	0.0000	*	R	R	
Germanium	µg/m^3	--	--	--	--	--	--	0.0012	0.0000	*	0.0012	0.0000	*	0.0012	0.0000	*	0.0012	0.0000	*	0.0012	0.0000	*	R	R	
Indium	µg/m^3	--	--	--	--	--	--	0.0027	0.0000	*	0.0021	0.0000	*	0.0018	0.0000	*	0.0021	0.0000	*	0.0018	0.0000	*	R	R	
Iron	µg/m^3	--	--	--	--	--	--	1.824	3.3790		1.122	4.3170		0.2707	2.2880		0.7223	3.1980		1.004	3.5190		R	R	
Lanthanum	µg/m^3	--	--	--	--	--	--	0.0153	0.0000	*	0.0087	0.0000	*	0.0042	0.0183	*	0.0075	0.0000	*	0.0105	0.0000	*	R	R	
Lead	µg/m^3	--	--	1.5 [9 10]	--	1.5 [9 10]	--	0.1123	0.2080		0.3432	1.3200		0.0062	0.0521		0.0191	0.0844		0.047	0.1646		R	R	
Magnesium	µg/m^3	--	--	--	--	--	--	0.136	0.2519		0.1482	0.5699		0.0657	0.5555		0.1703	0.7541		0.1858	0.6509		R	R	
Manganese	µg/m^3	2,500	0.0521	--	0.051	--	--	0.0272	0.0504		0.012	0.0460		0.003	0.0251		0.0099	0.0440		0.0133	0.0467		R	R	
Mercury	µg/m^3	1,000	0.313	--	0.31	--	1.8	0.0021	0.0000	*	0.0024	0.0000	*	0.0021	0.0000	*	0.0021	0.0044	*	0.0024	0.0000	*	R	R	
Molybdenum	µg/m^3	--	--	--	--	--	--	0.0138	0.0255		0.0172	0.0663		0.0027	0.0000	*	0.0032	0.0142		0.0063	0.0221		R	R	
Nickel	µg/m^3	5,000	0.0079	--	0.008	--	6	0.0021	0.0004	*	0.0024	0.0000	*	0.0021	0.0000	*	0.0024	0.0000	*	0.0024	0.0000	*	R	R	
Palladium	µg/m^3	--	--	--	--	--	--	0.0024	0.0012	*	0.0021	0.0000	*	0.0018	0.0000	*	0.0021	0.0000	*	0.0018	0.0000	*	R	R	
Phosphorus	µg/m^3	--	--	--	--	--	--	0.0078	0.0000	*	0.0054	0.0185	*	0.0039	0.0251	*	0.0091	0.0402		0.0048	0.0031	*	R	R	
Potassium	µg/m^3	--	--	--	--	--	--	1.061	1.9640		0.4368	1.6800		0.1712	1.4470		0.4595	2.0350		0.4159	1.4570		R	R	
Rubidium	µg/m^3	--	--	--	--	--	--	0.0044	0.0081		0.0025	0.0098		0.0009	0.0004	*	0.0012	0.0044	*	0.0019	0.0068		R	R	
Selenium	µg/m^3	500	18.3	--	--	--	--	0.0047	0.0086		0.0287	0.1103		0.0015	0.0123		0.0024	0.0106		0.0039	0.0137		R	R	
Silicon	µg/m^3	--	--	--	--	--	--	5.542	10.2600		1.893	7.2800		0.6691	5.6540		2.135	9.4530		2.257	7.9070		R	R	
Silver	µg/m^3	--	--	--	--	--	--	0.0027	0.0027	*	0.0021	0.0051	*	0.0018	0.0000	*	0.0018	0.0010	*	0.0021	0.0030	*	R	R	
Sodium	µg/m^3	--	--	--	--	--	--	0.1026	0.0141	*	0.066	0.0000	*	0.1634	1.3810		0.1764	0.5850	*	0.2004	0.6683	*	R	R	
Strontium	µg/m^3	--	--	--	--	--	--	0.0068	0.0126		0.0023	0.0089		0.0019	0.0163		0.0036	0.0158		0.0047	0.0163		R	R	
Sulfur	µg/m^3	--	--	--	--	--	--	0.9092	1.6840		1.356	5.2150		0.6775	5.7260		0.8244	3.6510		0.9892	3.4660		R	R	
Tin	µg/m^3	--	--	--	--	--	--	0.0033	0.0005	*	0.0027	0.0072	*	0.0024	0.0000	*	0.0024	0.0000	*	0.0033	0.0117		R	R	
Titanium	µg/m^3	--	--	--	31	--	--	0.1284	0.2378		0.0876	0.3370		0.0218	0.1846		0.0694	0.3073		0.1084	0.3797		R	R	
Vanadium	µg/m^3	--	--	--	--	--	--	0.0051	0.0000	*	0.003	0.0058	*	0.0012	0.0020	*	0.0027	0.0067	*	0.0039	0.0120	*	R	R	
Yttrium	µg/m^3	--	--	--	--	--	--	0.0012	0.0013	*	0.0027	0.0053	*	0.0015	0.0048	*	0.0015	0.0008	*	0.0015	0.0000	*	R	R	
Zinc	µg/m^3	--	--	--	--	--	--	0.0674	0.1249		0.1395	0.5366		0.0054	0.0454		0.015	0.0665		0.0335	0.1175		R	R	
Zirconium	µg/m^3	--	--	--	--	--	--	0.0055	0.0101		0.0041	0.0158		0.0018	0.0056	*	0.0021	0.0081	*	0.0021	0.0031	*	R	R	

Table Notes:

[1] Arizona Department of Environmental Quality Acute and Chronic Ambient Air Concentrations, Title 18 Chapter 2 Article 17, December 200
[2] Arizona Department of Environmental Quality Ambient Air Quality Standards, Title 18 Chapter 2 Article 2, December 200
[3] EPA Region IX Preliminary Remediation Goals, Ambient Air, October 200
[4] EPA National Ambient Air Quality Standards, http://www.epa.gov/air/criteria.html, February 200
[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] Samples are anticipated to be rejected by EPA during validation.
[12] Percent of Total Mass
[13] Precipitation measurements are recorded manually by a Hayden-Winkelman High School employee; reliability cannot be verifie
[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.
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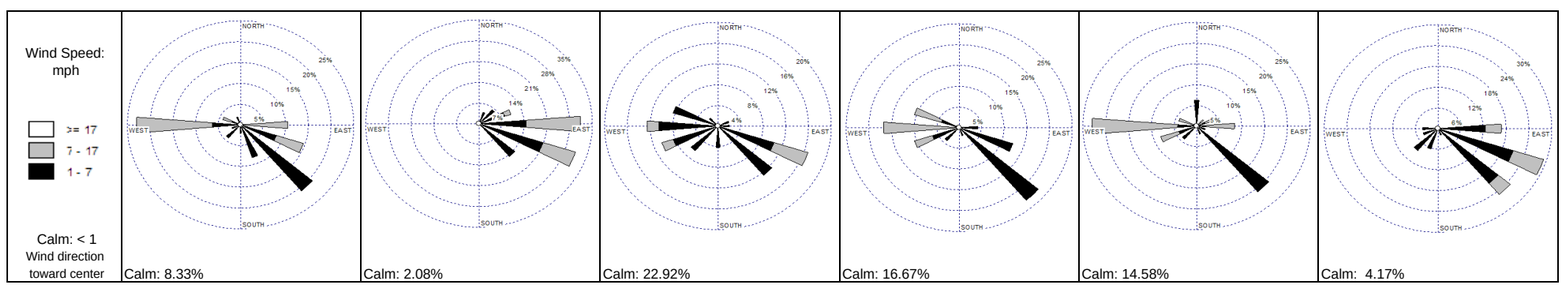

TABLE 1
Air Filter Sampling Laboratory Values for Inorganic Parameters
Hayden Monitoring Station
Data Evaluation Report
ASARCO LLC Hayden, Arizona Plant Site

Date:								07/24/08			07/27/08			07/30/08			08/02/08			08/05/08			08/08/08		
Avg Wind Speed mph):								4.41			5.16			4.60			5.03			5.22			5.78		
Avg Wind Direction (degrees):								138			271			254			262			101			211		
Avg Ambient Temperature (ºC):								31.9			31.8			31.4			33.4			30.9			30.2		
Avg Ambient Relative Humidity (%):								10.9			6.9			6.8			9.0			12.8			10.8		
Precipitation (inches)[7]:								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/m^3	--	--	150 [7]/50 [8]	--	150 [7]	--	18.32	NA		25.49	NA		23.55	NA		24.29	NA		32.16	NA		40.84	NA	
Aluminum	µg/m^3	--	--	--	5.1	--	--	0.4081	2.4670		0.6469	2.8030		0.6554	3.0780		0.549	2.5190		0.9431	3.2290		1.463	3.9420	
Antimony	µg/m^3	13,000	1.46	--	--	--	--	0.0027	0.0000	*	0.0027	0.0022	*	0.0027	0.0031	*	0.0024	0.0000	*	0.0044	0.0152		0.0086	0.0231	
Arsenic	µg/m^3	2,500	0.000441	--	0.00045	--	0.19	**0.0193**	0.1167		**0.0011**	0.0047		**0.0039**	0.0184		**0.0176**	0.0806		**0.0518**	0.1775		**0.0461**	0.1243	
Barium	µg/m^3	--	--	--	0.52	--	--	0.006	0.0324	*	0.0072	0.0000	*	0.0066	0.0212	*	0.0063	0.0063	*	0.0156	0.0534		0.0125	0.0336	
Bismuth	µg/m^3	--	--	--	--	--	--	0.0257	0.1551		NA	NA		NA	NA		0.0148	0.0681		0.06	0.2055		0.1407	0.3789	
Bromine	µg/m^3	--	--	--	--	--	--	0.0009	0.0048	*	0.0035	0.0151		0.0037	0.0175		0.0033	0.0151		0.0018	0.0016	*	0.0033	0.0000	*
Cadmium	µg/m^3	250	0.00105	--	0.0011	--	--	***0.0018***	0.0094	*	***0.0018***	0.0000	*	***0.0018***	0.0031	*	***0.0018***	0.0002	*	***0.0027***	0.0092	*	**0.0083**	0.0224	
Calcium	µg/m^3	--	--	--	--	--	--	0.3812	2.3040		0.5005	2.1680		0.4175	1.9610		0.5033	2.3100		0.5763	1.9730		0.9106	2.4530	
Chlorine	µg/m^3	--	--	--	--	--	--	0.0063	0.0236	*	0.4031	1.7460		0.2072	0.9732		0.0568	0.2606		0.0135	0.0000	*	0.0291	0.0000	*
Chromium	µg/m^3	100	0.000158	--	0.00016	--	--	***0.0009***	0.0026	*	***0.0009***	0.0006	*	***0.0009***	0.0035	*	***0.0009***	0.0022	*	**0.0022**	0.0074		**0.0022**	0.0060	
Cobalt	µg/m^3	10,000	0.000686	--	0.00069	--	--	***0.0078***	0.0000	*	***0.0063***	0.0000	*	***0.0063***	0.0000	*	***0.0063***	0.0000	*	0.0219	0.0000	*	0.024	0.0000	*
Copper	µg/m^3	--	--	--	--	--	100	0.4575	2.7660		0.0678	0.2939		0.115	0.5402		0.1693	0.7770		0.7693	2.6340		0.4193	1.1290	
Gallium	µg/m^3	--	--	--	--	--	--	0.0018	0.0000	*	0.0012	0.0008	*	0.0012	0.0000	*	0.0015	0.0000	*	0.0021	0.0000	*	0.0048	0.0000	*
Germanium	µg/m^3	--	--	--	--	--	--	0.0012	0.0000	*	0.0012	0.0004	*	0.0012	0.0002	*	0.0012	0.0000	*	0.0012	0.0000	*	0.0012	0.0000	*
Indium	µg/m^3	--	--	--	--	--	--	0.0018	0.0000	*	0.0018	0.0000	*	0.0018	0.0000	*	0.0018	0.0000	*	0.0027	0.0000	*	0.003	0.0016	*
Iron	µg/m^3	--	--	--	--	--	--	0.6064	3.6660		0.4622	2.0020		0.4732	2.2220		0.4646	2.1320		1.244	4.2590		1.369	3.6870	
Lanthanum	µg/m^3	--	--	--	--	--	--	0.0051	0.0000	*	0.0063	0.0049	*	0.0057	0.0000	*	0.0051	0.0000	*	0.0087	0.0000	*	0.012	0.0000	*
Lead	µg/m^3	--	--	1.5 [9 10]	--	1.5 [9 10]	--	0.0731	0.4418		0.0011	0.0047		0.0132	0.0619		0.0347	0.1595		0.1629	0.5577		0.457	1.2310	
Magnesium	µg/m^3	--	--	--	--	--	--	0.0549	0.2997	*	0.1496	0.6480		0.117	0.5495		0.0917	0.4209		0.0432	0.0917	*	0.2041	0.5497	
Manganese	µg/m^3	2,500	0.0521	--	0.051	--	--	0.0051	0.0307		0.0086	0.0373		0.0104	0.0486		0.0077	0.0352		0.0121	0.0413		0.0185	0.0498	
Mercury	µg/m^3	1,000	0.313	--	0.31	--	1.8	0.0024	0.0000	*	0.0021	0.0000	*	0.0021	0.0000	*	0.0021	0.0026	*	0.0021	0.0000	*	0.0021	0.0000	*
Molybdenum	µg/m^3	--	--	--	--	--	--	0.0132	0.0797		0.0027	0.0053	*	0.0069	0.0323		0.0043	0.0197		0.0162	0.0556		0.0093	0.0251	
Nickel	µg/m^3	5,000	0.0079	--	0.008	--	6	0.0024	0.0000	*	0.0024	0.0065	*	0.0021	0.0053	*	0.0021	0.0076	*	0.0021	0.0008	*	0.0021	0.0029	*
Palladium	µg/m^3	--	--	--	--	--	--	0.0018	0.0000	*	0.0018	0.0000	*	0.0018	0.0000	*	0.0018	0.0009	*	0.0024	0.0000	*	0.0024	0.0023	*
Phosphorus	µg/m^3	--	--	--	--	--	--	0.0042	0.0000	*	0.0045	0.0000	*	0.0042	0.0000	*	0.0042	0.0032	*	0.0063	0.0000	*	0.0072	0.0000	*
Potassium	µg/m^3	--	--	--	--	--	--	0.2213	1.3380		0.4158	1.8010		0.4134	1.9420		0.3987	1.8300		0.6126	2.0970		0.6827	1.8390	
Rubidium	µg/m^3	--	--	--	--	--	--	0.0012	0.0063	*	0.0012	0.0029	*	0.0011	0.0053		0.0016	0.0073		0.0033	0.0114		0.0058	0.0157	
Selenium	µg/m^3	500	18.3	--	--	--	--	0.0077	0.0464		0.0016	0.0067		0.0011	0.0053		0.0046	0.0210		0.0094	0.0322		0.0161	0.0435	
Silicon	µg/m^3	--	--	--	--	--	--	1.147	6.9340		2.117	9.1730		1.948	9.1510		1.496	6.8660		2.546	8.7160		3.857	10.3900	
Silver	µg/m^3	--	--	--	--	--	--	0.0018	0.0000	*	0.0018	0.0008	*	0.0018	0.0004	*	0.0018	0.0019	*	0.0024	0.0000	*	0.0024	0.0000	*
Sodium	µg/m^3	--	--	--	--	--	--	0.1449	0.4574	*	0.6446	2.7920		0.3213	1.5090		0.3046	1.3980		0.0801	0.1523	*	0.111	0.0620	*
Strontium	µg/m^3	--	--	--	--	--	--	0.002	0.0120		0.0021	0.0092		0.0032	0.0148		0.0032	0.0149		0.0034	0.0116		0.0054	0.0146	
Sulfur	µg/m^3	--	--	--	--	--	--	0.8894	5.3770		0.8687	3.7630		0.5947	2.7930		0.9007	4.1330		1.24	4.2460		0.9417	2.5360	
Tin	µg/m^3	--	--	--	--	--	--	0.0027	0.0088	*	0.0027	0.0092	*	0.0027	0.0082	*	0.0036	0.0164		0.0038	0.0131		0.0036	0.0022	*
Titanium	µg/m^3	--	--	--	31	--	--	0.0325	0.1964		0.0427	0.1848		0.041	0.1924		0.0363	0.1664		0.0638	0.2186		0.1115	0.3004	
Vanadium	µg/m^3	--	--	--	--	--	--	0.0015	0.0026	*	0.0035	0.0151		0.0018	0.0088	*	0.0015	0.0022	*	0.0024	0.0000	*	0.0036	0.0048	*
Yttrium	µg/m^3	--	--	--	--	--	--	0.0015	0.0000	*	0.0015	0.0000	*	0.0015	0.0009	*	0.0015	0.0022	*	0.0012	0.0000	*	0.0012	0.0000	*
Zinc	µg/m^3	--	--	--	--	--	--	0.033	0.1995		0.0032	0.0137		0.0121	0.0568		0.0213	0.0979		0.0934	0.3198		0.1749	0.4712	
Zirconium	µg/m^3	--	--	--	--	--	--	0.0021	0.0060	*	0.0018	0.0037	*	0.0018	0.0000	*	0.0018	0.0050	*	0.0033	0.0113		0.0043	0.0115	

Table Notes:

[1] Arizona Department of Environmental Quality Acute and Chronic Ambient Air Concentrations, Title 18 Chapter 2 Article 17, December 200
[2] Arizona Department of Environmental Quality Ambient Air Quality Standards, Title 18 Chapter 2 Article 2, December 200
[3] EPA Region IX Preliminary Remediation Goals, Ambient Air, October 200
[4] EPA National Ambient Air Quality Standards, http://www.epa.gov/air/criteria.html, February 200
[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] Samples are anticipated to be rejected by EPA during validation.
[12] Percent of Total Mass
[13] Precipitation measurements are recorded manually by a Hayden-Winkelman High School employee; reliability cannot be verifie
[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 due to sample volume issues with the instrument.
[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

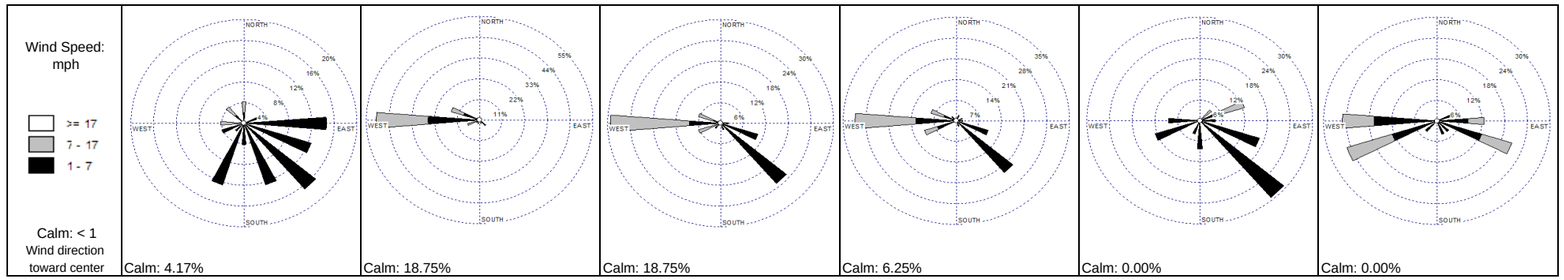

TABLE 1
Air Filter Sampling Laboratory Values for Inorganic Parameters
Hayden Monitoring Station
Data Evaluation Report
ASARCO LLC Hayden, Arizona Plant Site

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]	08/11/08			08/14/08			08/17/08			08/20/08			09/12/08			09/18/08		
Avg Wind Speed mph):								5.41			4.66			5.34			3.73			4.72			3.98		
Avg Wind Direction (degrees):								234			120			171			175			204			164		
Avg Ambient Temperature (ºC):								32.8			28.3			30.5			30.8			25.0			27.3		
Avg Ambient Relative Humidity (%):								7.3			19.4			8.7			9.0			17.5			7.7		
Precipitation (inches)[7]:								NA			NA			NA			NA			NA			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/m^3	--	--	150 [7]/50 [8]	--	150 [7]	--	35.79	NA		15.99	NA		23.43	NA		32.1	NA		40.7	NA		29.01	NA	
Aluminum	µg/m^3	--	--	--	5.1	--	--	1.222	3.7980		0.2516	1.7200		0.6262	2.9470		1.015	3.4950		1.799	4.7920		0.6785	2.5440	
Antimony	µg/m^3	13,000	1.46	--	--	--	--	0.0057	0.0179		0.0082	0.0560		0.0146	0.0687		0.012	0.0412		0.0033	0.0000	*	0.0033	0.0046	*
Arsenic	µg/m^3	2,500	0.000441	--	0.00045	--	0.19	**0.0122**	0.0379		**0.0214**	0.1465		**0.0283**	0.1332		**0.0089**	0.0308		**0.0055**	0.0145		**0.0124**	0.0464	
Barium	µg/m^3	--	--	--	0.52	--	--	0.0126	0.0391		0.006	0.0000	*	0.0074	0.0350		0.0141	0.0276	*	0.0102	0.0167	*	0.0069	0.0072	*
Bismuth	µg/m^3	--	--	--	--	--	--	0.0103	0.0321		0.0554	0.3786		0.0547	0.2572		NA	NA		NA	NA		NA	NA	
Bromine	µg/m^3	--	--	--	--	--	--	0.003	0.0094		0.0015	0.0000	*	0.0018	0.0000	*	0.0013	0.0045		0.0023	0.0061		0.0012	0.0028	*
Cadmium	µg/m^3	250	0.00105	--	0.0011	--	--	0.0024	0.0016	*	**0.0033**	0.0225		***0.0027***	0.0066	*	0.0027	0.0000	*	***0.0024***	0.0050	*	***0.0021***	0.0074	*
Calcium	µg/m^3	--	--	--	--	--	--	0.9949	3.0930		0.218	1.4910		0.3428	1.6130		0.8532	2.9380		1.315	3.5030		0.5904	2.2140	
Chlorine	µg/m^3	--	--	--	--	--	--	0.0237	0.0736		0.012	0.0000	*	0.015	0.0000	*	0.0339	0.1169		0.0074	0.0198		0.0093	0.0350	
Chromium	µg/m^3	100	0.000158	--	0.00016	--	--	***0.0015***	0.0045	*	***0.0012***	0.0042	*	***0.0012***	0.0042	*	0.0015	0.0000	*	***0.0012***	0.0025	*	***0.0009***	0.0039	*
Cobalt	µg/m^3	10,000	0.000686	--	0.00069	--	--	0.0291	0.0000	*	0.0087	0.0000	*	0.0126	0.0000	*	0.0213	0.0000	*	0.015	0.0000	*	0.009	0.0000	*
Copper	µg/m^3	--	--	--	--	--	100	0.5123	1.5930		0.5127	3.5060		0.5358	2.5210		0.3036	1.0460		0.1197	0.3189		0.1377	0.5164	
Gallium	µg/m^3	--	--	--	--	--	--	0.0015	0.0000	*	0.0021	0.0000	*	0.0024	0.0000	*	0.0015	0.0000	*	0.0021	0.0000	*	0.0021	0.0000	*
Germanium	µg/m^3	--	--	--	--	--	--	0.0012	0.0000	*	0.0012	0.0000	*	0.0012	0.0000	*	0.0012	0.0000	*	0.0015	0.0000	*	0.0015	0.0000	*
Indium	µg/m^3	--	--	--	--	--	--	0.0027	0.0000	*	0.0027	0.0000	*	0.003	0.0000	*	0.003	0.0000	*	0.0024	0.0000	*	0.0021	0.0000	*
Iron	µg/m^3	--	--	--	--	--	--	1.661	5.1640		0.4639	3.1720		0.6931	3.2610		1.196	4.1200		1.146	3.0510		0.6667	2.5000	
Lanthanum	µg/m^3	--	--	--	--	--	--	0.012	0.0000	*	0.006	0.0000	*	0.0069	0.0000	*	0.015	0.0000	*	0.0108	0.0000	*	0.0075	0.0000	*
Lead	µg/m^3	--	--	1.5 [9 10]	--	1.5 [9 10]	--	0.0417	0.1295		0.1646	1.1250		0.1981	0.9324		0.0363	0.1248		0.0136	0.0362		0.0462	0.1734	
Magnesium	µg/m^3	--	--	--	--	--	--	0.1669	0.5187		0.0607	0.4150		0.0363	0.1316	*	0.1358	0.4677		0.3997	1.0650		0.1975	0.7405	
Manganese	µg/m^3	2,500	0.0521	--	0.051	--	--	0.0184	0.0572		0.0036	0.0248		0.0069	0.0323		0.0171	0.0589		0.0284	0.0758		0.0105	0.0396	
Mercury	µg/m^3	1,000	0.313	--	0.31	--	1.8	0.0021	0.0000	*	0.0021	0.0000	*	0.0024	0.0000	*	0.0021	0.0000	*	0.003	0.0000	*	0.0027	0.0000	*
Molybdenum	µg/m^3	--	--	--	--	--	--	0.0099	0.0309		0.0055	0.0373		0.0134	0.0631		0.0033	0.0115		0.0033	0.0005	*	0.0033	0.0064	*
Nickel	µg/m^3	5,000	0.0079	--	0.008	--	6	0.0021	0.0019	*	0.0021	0.0000	*	0.0021	0.0075	*	0.0021	0.0006	*	0.0033	0.0066	*	0.003	0.0039	*
Palladium	µg/m^3	--	--	--	--	--	--	0.0024	0.0000	*	0.0024	0.0000	*	0.0024	0.0000	*	0.0024	0.0000	*	0.0024	0.0000	*	0.0024	0.0000	*
Phosphorus	µg/m^3	--	--	--	--	--	--	0.0063	0.0000	*	0.0048	0.0000	*	0.0057	0.0000	*	0.0063	0.0000	*	0.0058	0.0154		0.0039	0.0129	*
Potassium	µg/m^3	--	--	--	--	--	--	0.6997	2.1750		0.1646	1.1250		0.3947	1.8570		0.5085	1.7510		0.6629	1.7660		0.3253	1.2200	
Rubidium	µg/m^3	--	--	--	--	--	--	0.0031	0.0097		0.0015	0.0100		0.0017	0.0082		0.0026	0.0091		0.004	0.0108		0.0015	0.0042	*
Selenium	µg/m^3	500	18.3	--	--	--	--	0.0016	0.0048		0.007	0.0480		0.0175	0.0822		0.0021	0.0071		0.0012	0.0019	*	0.0015	0.0055	
Silicon	µg/m^3	--	--	--	--	--	--	3.224	10.0200		0.6794	4.6460		1.786	8.4060		2.854	9.8280		4.568	12.1700		1.872	7.0180	
Silver	µg/m^3	--	--	--	--	--	--	0.0024	0.0000	*	0.0024	0.0048	*	0.0024	0.0049	*	0.0024	0.0023	*	0.0024	0.0003	*	0.0021	0.0039	*
Sodium	µg/m^3	--	--	--	--	--	--	0.2039	0.6338		0.0546	0.1378	*	0.1614	0.4298	*	0.0714	0.0814	*	0.1731	0.2385	*	0.1395	0.2456	*
Strontium	µg/m^3	--	--	--	--	--	--	0.0053	0.0164		0.0009	0.0052	*	0.002	0.0095		0.0048	0.0167		0.0084	0.0224		0.0024	0.0092	
Sulfur	µg/m^3	--	--	--	--	--	--	0.9718	3.0210		0.7336	5.0160		1.045	4.9170		0.7496	2.5810		0.4549	1.2120		0.7519	2.8200	
Tin	µg/m^3	--	--	--	--	--	--	0.0036	0.0083	*	0.0036	0.0190	*	0.0036	0.0051	*	0.0036	0.0028	*	0.003	0.0036	*	0.003	0.0095	*
Titanium	µg/m^3	--	--	--	31	--	--	0.1077	0.3348		0.032	0.2186		0.0419	0.1970		0.1465	0.5044		0.1125	0.2997		0.0727	0.2726	
Vanadium	µg/m^3	--	--	--	--	--	--	0.0036	0.0070	*	0.0015	0.0000	*	0.0018	0.0009	*	0.0048	0.0096	*	0.0039	0.0073	*	0.0027	0.0023	*
Yttrium	µg/m^3	--	--	--	--	--	--	0.0012	0.0009	*	0.0012	0.0000	*	0.0012	0.0000	*	0.0012	0.0000	*	0.0021	0.0000	*	0.0021	0.0000	*
Zinc	µg/m^3	--	--	--	--	--	--	0.0427	0.1328		0.057	0.3895		0.0905	0.4259		0.0203	0.0700		0.0129	0.0342		0.0415	0.1556	
Zirconium	µg/m^3	--	--	--	--	--	--	0.0037	0.0114		0.0027	0.0184		0.0026	0.0122		0.0019	0.0065		0.0035	0.0094		0.0024	0.0081	*

Table Notes:

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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

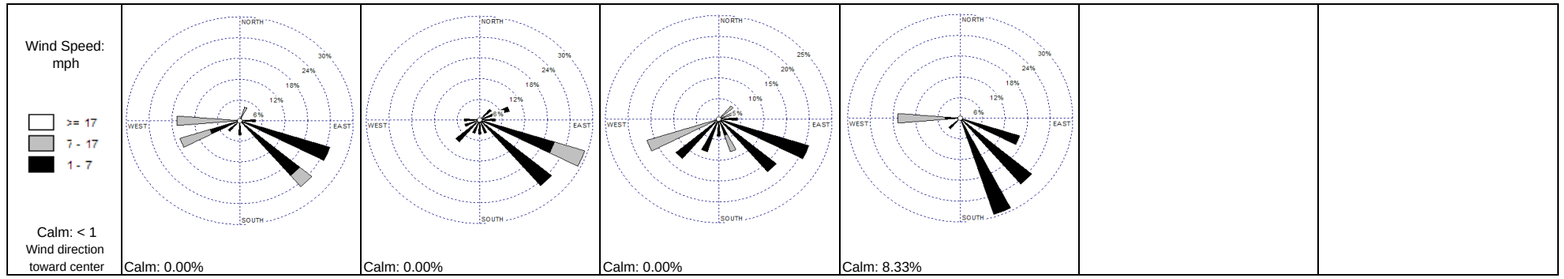

TABLE 1
Air Filter Sampling Laboratory Values for Inorganic Parameters
Hayden Monitoring Station
Data Evaluation Report
ASARCO LLC Hayden, Arizona Plant Site

Date:								09/24/08			09/30/08			10/06/08			10/12/08			10/22/08			10/25/08		
Avg Wind Speed mph):								5.65			7.27			3.60			3.91			8.89			3.67		
Avg Wind Direction (degrees):								110			69			117			267			39			186		
Avg Ambient Temperature (ºC):								29.3			30.2			22.0			13.8			21.3			19.3		
Avg Ambient Relative Humidity (%):								6.2			5.6			8.9			7.7			6.7			6.9		
Precipitation (inches)[7]:								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/m^3	--	--	150 [7]/50 [8]	--	150 [7]	--	34.77	NA		**56.77**	NA		32.73	NA		R	NA		48.73	NA		R	NA	
Aluminum	µg/m^3	--	--	--	5.1	--	--	0.8277	2.6070		0.7726	1.4910		0.9511	3.1060		R	R		1.605	3.5010		R	R	
Antimony	µg/m^3	13,000	1.46	--	--	--	--	0.0037	0.0117		0.0054	0.0104		0.003	0.0000	*	R	R		0.0036	0.0055	*	R	R	
Arsenic	µg/m^3	2,500	0.000441	--	0.00045	--	0.19	**0.0222**	0.0698		**0.1554**	0.2998		**0.0095**	0.0309		R	R		**0.0384**	0.0838		R	R	
Barium	µg/m^3	--	--	--	0.52	--	--	0.0062	0.0194		0.0293	0.0565		0.0078	0.0131	*	R	R		0.0186	0.0405		R	R	
Bismuth	µg/m^3	--	--	--	--	--	--	NA	NA		NA	NA		NA	NA		NA	NA		0.0584	0.1274		NA	NA	
Bromine	µg/m^3	--	--	--	--	--	--	0.0015	0.0025	*	0.0057	0.0000	*	0.0021	0.0068		R	R		0.0018	0.0034	*	R	R	
Cadmium	µg/m^3	250	0.00105	--	0.0011	--	--	***0.0024***	0.0065	*	**0.0203**	0.0392		0.0021	0.0014	*	R	R		**0.0042**	0.0091		R	R	
Calcium	µg/m^3	--	--	--	--	--	--	0.5254	1.6550		0.8781	1.6940		0.7227	2.3600		R	R		1.467	3.2010		R	R	
Chlorine	µg/m^3	--	--	--	--	--	--	0.0135	0.0424		0.0219	0.0226	*	0.0213	0.0696		R	R		0.0437	0.0954		R	R	
Chromium	µg/m^3	100	0.000158	--	0.00016	--	--	**0.0012**	0.0037		**0.0040**	0.0077		***0.0009***	0.0026	*	R	R		**0.0036**	0.0079		R	R	
Cobalt	µg/m^3	10,000	0.000686	--	0.00069	--	--	0.0099	0.0000	*	0.0291	0.0000	*	0.0126	0.0000	*	R	R		0.0372	0.0000	*	R	R	
Copper	µg/m^3	--	--	--	--	--	100	0.4854	1.5290		3.821	7.3710		0.2504	0.8176		R	R		1.341	2.9270		R	R	
Gallium	µg/m^3	--	--	--	--	--	--	0.0027	0.0000	*	0.0096	0.0000	*	0.0018	0.0000	*	R	R		0.003	0.0000	*	R	R	
Germanium	µg/m^3	--	--	--	--	--	--	0.0015	0.0000	*	0.0018	0.0000	*	0.0012	0.0000	*	R	R		0.0018	0.0000	*	R	R	
Indium	µg/m^3	--	--	--	--	--	--	0.0024	0.0000	*	0.0027	0.0045	*	0.0021	0.0000	*	R	R		0.0024	0.0006	*	R	R	
Iron	µg/m^3	--	--	--	--	--	--	0.7364	2.3190		2.26	4.3600		0.9699	3.1670		R	R		2.898	6.3230		R	R	
Lanthanum	µg/m^3	--	--	--	--	--	--	0.0063	0.0000	*	0.0111	0.0000	*	0.0084	0.0000	*	R	R		0.0162	0.0000	*	R	R	
Lead	µg/m^3	--	--	1.5 [9 10]	--	1.5 [9 10]	--	0.1263	0.3979		0.9676	1.8670		0.02	0.0652		R	R		0.1968	0.4294		R	R	
Magnesium	µg/m^3	--	--	--	--	--	--	0.1096	0.3452		0.0957	0.1351	*	0.2259	0.7375		R	R		0.3714	0.8103		R	R	
Manganese	µg/m^3	2,500	0.0521	--	0.051	--	--	0.0084	0.0265		0.0103	0.0199		0.0124	0.0406		R	R		0.026	0.0568		R	R	
Mercury	µg/m^3	1,000	0.313	--	0.31	--	1.8	0.0033	0.0000	*	0.0042	0.0000	*	0.0027	0.0002	*	R	R		0.0033	0.0000	*	R	R	
Molybdenum	µg/m^3	--	--	--	--	--	--	0.0093	0.0292		0.085	0.1640		0.0048	0.0158		R	R		0.0351	0.0765		R	R	
Nickel	µg/m^3	5,000	0.0079	--	0.008	--	6	0.0033	0.0000	*	0.0036	0.0000	*	0.003	0.0061	*	R	R		0.0036	0.0000	*	R	R	
Palladium	µg/m^3	--	--	--	--	--	--	0.0024	0.0000	*	0.0027	0.0000	*	0.0024	0.0000	*	R	R		0.0024	0.0000	*	R	R	
Phosphorus	µg/m^3	--	--	--	--	--	--	0.0036	0.0000	*	0.012	0.0000	*	0.0036	0.0038	*	R	R		0.0051	0.0088	*	R	R	
Potassium	µg/m^3	--	--	--	--	--	--	0.5203	1.6390		0.4668	0.9005		0.3818	1.2470		R	R		0.7256	1.5830		R	R	
Rubidium	µg/m^3	--	--	--	--	--	--	0.0017	0.0053		0.0076	0.0146		0.0015	0.0034	*	R	R		0.0041	0.0089		R	R	
Selenium	µg/m^3	500	18.3	--	--	--	--	0.0036	0.0114		0.0458	0.0884		0.0016	0.0054		R	R		0.0156	0.0341		R	R	
Silicon	µg/m^3	--	--	--	--	--	--	2.299	7.2410		2.412	4.6530		2.556	8.3450		R	R		4.289	9.3570		R	R	
Silver	µg/m^3	--	--	--	--	--	--	0.0024	0.0047	*	0.01	0.0193		0.0021	0.0006	*	R	R		0.0024	0.0049	*	R	R	
Sodium	µg/m^3	--	--	--	--	--	--	0.0558	0.0991	*	0.2298	0.0000	*	0.0507	0.0727	*	R	R		0.0747	0.0000	*	R	R	
Strontium	µg/m^3	--	--	--	--	--	--	0.0035	0.0111		0.0036	0.0070		0.0051	0.0166		R	R		0.008	0.0175		R	R	
Sulfur	µg/m^3	--	--	--	--	--	--	0.8061	2.5390		3.743	7.2210		0.5537	1.8080		R	R		1.004	2.1910		R	R	
Tin	µg/m^3	--	--	--	--	--	--	0.0033	0.0085	*	0.0061	0.0117		0.0027	0.0000	*	R	R		0.0033	0.0061	*	R	R	
Titanium	µg/m^3	--	--	--	31	--	--	0.0531	0.1671		0.0904	0.1744		0.0844	0.2757		R	R		0.1772	0.3867		R	R	
Vanadium	µg/m^3	--	--	--	--	--	--	0.0021	0.0025	*	0.0039	0.0068	*	0.0033	0.0095	*	R	R		0.0063	0.0104	*	R	R	
Yttrium	µg/m^3	--	--	--	--	--	--	0.0024	0.0000	*	0.0063	0.0053	*	0.0018	0.0002	*	R	R		0.0027	0.0031	*	R	R	
Zinc	µg/m^3	--	--	--	--	--	--	0.0938	0.2954		0.7133	1.3760		0.0316	0.1033		R	R		0.1694	0.3695		R	R	
Zirconium	µg/m^3	--	--	--	--	--	--	0.0027	0.0040	*	0.005	0.0096		0.0032	0.0103		R	R		0.0049	0.0107		R	R	

Table Notes:

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[3] EPA Region IX Preliminary Remediation Goals, Ambient Air, October 200
[4] EPA National Ambient Air Quality Standards, http://www.epa.gov/air/criteria.html, February 200
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[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.
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[11] Samples are anticipated to be rejected by EPA during validation.
[12] Percent of Total Mass
[13] Precipitation measurements are recorded manually by a Hayden-Winkelman High School employee; reliability cannot be verifie
[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 due to sample volume issues with the instrument.
[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

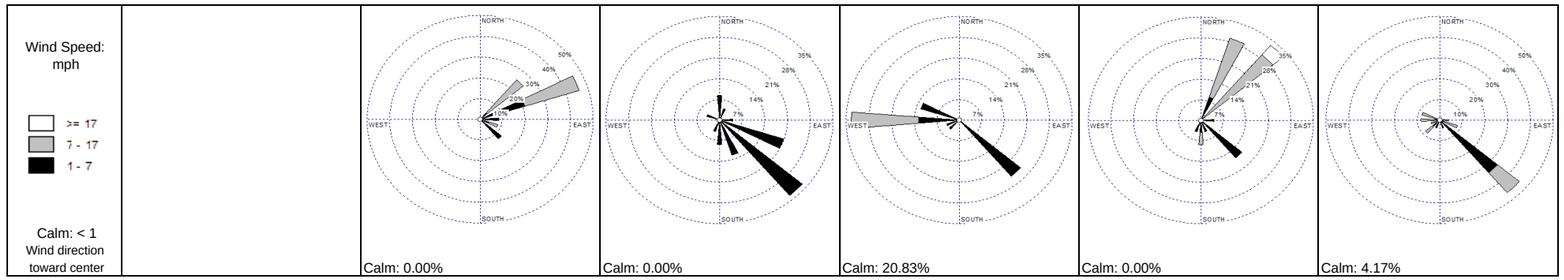

TABLE 1
Air Filter Sampling Laboratory Values for Inorganic Parameters
Hayden Monitoring Station
Data Evaluation Report
ASARCO LLC Hayden, Arizona Plant Site

Date:								10/28/08			11/09/08			11/12/08			11/21/08 [11]			11/24/08			11/27/08 [11]		
Avg Wind Speed mph):								9.13			6.46			2.11			14.60			7.33			3.67		
Avg Wind Direction (degrees):								52			168			129			63			75			95		
Avg Ambient Temperature (ºC):								25.0			13.0			7.8			16.9			16.5			13.6		
Avg Ambient Relative Humidity (%):								6.2			12.7			10.4			7.3			7.3			35.4		
Precipitation (inches)[7]:								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/m^3	--	--	150 [7]/50 [8]	--	150 [7]	--	R	NA		**177.21**	NA		32.81	NA		R	NA		37.59	NA		R	NA	
Aluminum	µg/m^3	--	--	--	5.1	--	--	R	R		**7.213**	4.2530		0.5057	3.9020		R	R		1.073	2.9760		R	R	
Antimony	µg/m^3	13,000	1.46	--	--	--	--	R	R		0.0042	0.0021	*	0.0033	0.0000	*	R	R		0.0078	0.0189	*	R	R	
Arsenic	µg/m^3	2,500	0.000441	--	0.00045	--	0.19	R	R		**0.0299**	0.0177		0.0027	0.0029	*	R	R		**0.0469**	0.1302		R	R	
Barium	µg/m^3	--	--	--	0.52	--	--	R	R		0.0596	0.0351		0.0066	0.0138	*	R	R		0.0169	0.0468		R	R	
Bismuth	µg/m^3	--	--	--	--	--	--	R	R		0.0383	0.0226		NA	NA		R	R		0.0433	0.1202		R	R	
Bromine	µg/m^3	--	--	--	--	--	--	R	R		0.0019	0.0011		0.0012	0.0062	*	R	R		0.0012	0.0026	*	R	R	
Cadmium	µg/m^3	250	0.00105	--	0.0011	--	--	R	R		***0.003***	0.0016	*	0.0021	0.0000	*	R	R		**0.0037**	0.0102		R	R	
Calcium	µg/m^3	--	--	--	--	--	--	R	R		3.902	2.3010		0.4625	3.5690		R	R		1.223	3.3930		R	R	
Chlorine	µg/m^3	--	--	--	--	--	--	R	R		0.2103	0.1240		0.0083	0.0643		R	R		0.0105	0.0000	*	R	R	
Chromium	µg/m^3	100	0.000158	--	0.00016	--	--	R	R		**0.0104**	0.0061		***0.0009***	0.0029	*	R	R		***0.0015***	0.0037	*	R	R	
Cobalt	µg/m^3	10,000	0.000686	--	0.00069	--	--	R	R		0.0573	0.0000	*	0.0072	0.0000	*	R	R		***0.0177***	0.0037	*	R	R	
Copper	µg/m^3	--	--	--	--	--	100	R	R		1.172	0.6913		0.0845	0.6518		R	R		0.7524	2.0880		R	R	
Gallium	µg/m^3	--	--	--	--	--	--	R	R		0.0027	0.0000	*	0.0018	0.0000	*	R	R		0.0021	0.0000	*	R	R	
Germanium	µg/m^3	--	--	--	--	--	--	R	R		0.0018	0.0000	*	0.0015	0.0007	*	R	R		0.0012	0.0000	*	R	R	
Indium	µg/m^3	--	--	--	--	--	--	R	R		0.0027	0.0000	*	0.0021	0.0000	*	R	R		0.003	0.0020	*	R	R	
Iron	µg/m^3	--	--	--	--	--	--	R	R		7.161	4.2230		0.5989	4.6220		R	R		1.342	3.7230		R	R	
Lanthanum	µg/m^3	--	--	--	--	--	--	R	R		0.0552	0.0000	*	0.0072	0.0000	*	R	R		0.0105	0.0000	*	R	R	
Lead	µg/m^3	--	--	1.5 [9 10]	--	1.5 [9 10]	--	R	R		0.0887	0.0523		0.0071	0.0545		R	R		0.111	0.3079		R	R	
Magnesium	µg/m^3	--	--	--	--	--	--	R	R		1.273	0.7505		0.1311	1.0120		R	R		0.0486	0.0000	*	R	R	
Manganese	µg/m^3	2,500	0.0521	--	0.051	--	--	R	R		**0.1113**	0.0656		0.0096	0.0741		R	R		0.0173	0.0481		R	R	
Mercury	µg/m^3	1,000	0.313	--	0.31	--	1.8	R	R		0.0039	0.0000	*	0.003	0.0109	*	R	R		0.0024	0.0000	*	R	R	
Molybdenum	µg/m^3	--	--	--	--	--	--	R	R		0.0428	0.0253		0.0033	0.0109	*	R	R		0.0171	0.0474		R	R	
Nickel	µg/m^3	5,000	0.0079	--	0.008	--	6	R	R		0.0042	0.0001	*	0.003	0.0149	*	R	R		0.0024	0.0000	*	R	R	
Palladium	µg/m^3	--	--	--	--	--	--	R	R		0.003	0.0000	*	0.0024	0.0000	*	R	R		0.0024	0.0012	*	R	R	
Phosphorus	µg/m^3	--	--	--	--	--	--	R	R		0.0216	0.0026	*	0.0027	0.0000	*	R	R		0.0066	0.0000	*	R	R	
Potassium	µg/m^3	--	--	--	--	--	--	R	R		3.573	2.1070		0.2516	1.9410		R	R		0.5222	1.4490		R	R	
Rubidium	µg/m^3	--	--	--	--	--	--	R	R		0.0274	0.0162		0.0017	0.0134		R	R		0.0032	0.0089		R	R	
Selenium	µg/m^3	500	18.3	--	--	--	--	R	R		0.0074	0.0044		0.0012	0.0015	*	R	R		0.0256	0.0711		R	R	
Silicon	µg/m^3	--	--	--	--	--	--	R	R		18.74	11.0500		1.427	11.0100		R	R		2.86	7.9360		R	R	
Silver	µg/m^3	--	--	--	--	--	--	R	R		0.003	0.0011	*	0.0021	0.0004	*	R	R		0.0027	0.0022	*	R	R	
Sodium	µg/m^3	--	--	--	--	--	--	R	R		1.6269	0.5450	*	0.1143	0.6431	*	R	R		0.0846	0.0000	*	R	R	
Strontium	µg/m^3	--	--	--	--	--	--	R	R		0.0347	0.0205		0.0027	0.0211		R	R		0.0062	0.0172		R	R	
Sulfur	µg/m^3	--	--	--	--	--	--	R	R		1.688	0.9953		0.1282	0.9894		R	R		0.8338	2.3140		R	R	
Tin	µg/m^3	--	--	--	--	--	--	R	R		0.0047	0.0028		0.0027	0.0069	*	R	R		0.0036	0.0048	*	R	R	
Titanium	µg/m^3	--	--	--	31	--	--	R	R		0.6163	0.3634		0.0686	0.5290		R	R		0.088	0.2443		R	R	
Vanadium	µg/m^3	--	--	--	--	--	--	R	R		0.0266	0.0157		0.0027	0.0113	*	R	R		0.003	0.0026	*	R	R	
Yttrium	µg/m^3	--	--	--	--	--	--	R	R		0.0047	0.0027		0.0021	0.0000	*	R	R		0.0015	0.0000	*	R	R	
Zinc	µg/m^3	--	--	--	--	--	--	R	R		0.1012	0.0597		0.0083	0.0643		R	R		0.0805	0.2234		R	R	
Zirconium	µg/m^3	--	--	--	--	--	--	R	R		0.0263	0.0155		0.0024	0.0047	*	R	R		0.0018	0.0026	*	R	R	

Table Notes:

[1] Arizona Department of Environmental Quality Acute and Chronic Ambient Air Concentrations, Title 18 Chapter 2 Article 17, December 200
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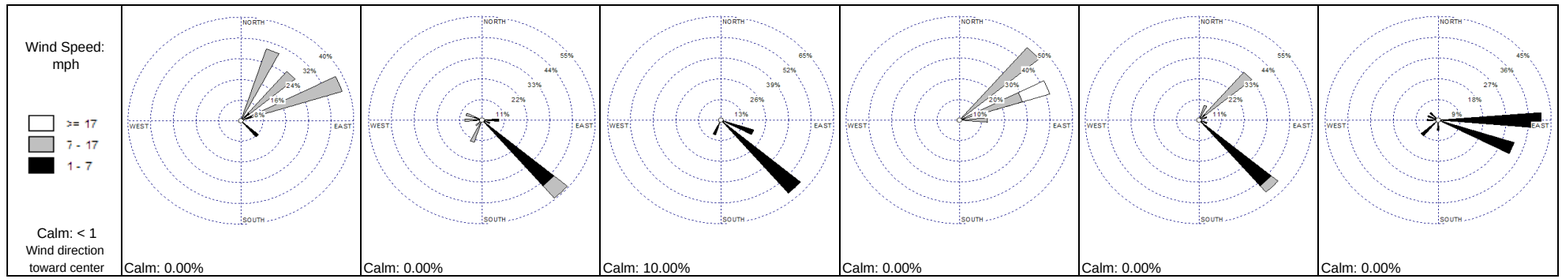

TABLE 1
Air Filter Sampling Laboratory Values for Inorganic Parameters
Hayden Monitoring Station
Data Evaluation Report
ASARCO LLC Hayden, Arizona Plant Site

Date:								**11/30/08**		
Avg Wind Speed mph):								**3.36**		
Avg Wind Direction (degrees):								**259**		
Avg Ambient Temperature (ºC):								**12.1**		
Avg Ambient Relative Humidity (%):								**25.1**		
Precipitation (inches)[7]:								**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**
PM_{10}	µg/m^3	--	--	150 [7]/50 [8]	--	150 [7]	--	21.24	NA	
Aluminum	µg/m^3	--	--	--	5.1	--	--	0.5094	2.8240	
Antimony	µg/m^3	13,000	1.46	--	--	--	--	0.0092	0.0512	
Arsenic	µg/m^3	2,500	0.000441	--	0.00045	--	0.19	0.0169	**0.0937**	
Barium	µg/m^3	--	--	--	0.52	--	--	0.0069	0.0256	*
Bismuth	µg/m^3	--	--	--	--	--	--	0.0133	0.0736	
Bromine	µg/m^3	--	--	--	--	--	--	0.0015	0.0084	
Cadmium	µg/m^3	250	0.00105	--	0.0011	--	--	0.0027	0.0047	*
Calcium	µg/m^3	--	--	--	--	--	--	0.3144	1.7420	
Chlorine	µg/m^3	--	--	--	--	--	--	0.0072	0.0000	*
Chromium	µg/m^3	100	0.000158	--	0.00016	--	--	***0.0012***	0.0052	*
Cobalt	µg/m^3	10,000	0.000686	--	0.00069	--	--	0.0078	0.0000	*
Copper	µg/m^3	--	--	--	--	--	100	0.1819	1.0080	
Gallium	µg/m^3	--	--	--	--	--	--	0.0015	0.0000	*
Germanium	µg/m^3	--	--	--	--	--	--	0.0012	0.0000	*
Indium	µg/m^3	--	--	--	--	--	--	0.0027	0.0000	*
Iron	µg/m^3	--	--	--	--	--	--	0.5528	3.0640	
Lanthanum	µg/m^3	--	--	--	--	--	--	0.0069	0.0000	*
Lead	µg/m^3	--	--	1.5 [9 10]	--	1.5 [9 10]	--	0.0328	0.1816	
Magnesium	µg/m^3	--	--	--	--	--	--	0.0567	0.2330	*
Manganese	µg/m^3	2,500	0.0521	--	0.051	--	--	0.005	0.0277	
Mercury	µg/m^3	1,000	0.313	--	0.31	--	1.8	0.0024	0.0000	*
Molybdenum	µg/m^3	--	--	--	--	--	--	0.0045	0.0248	
Nickel	µg/m^3	5,000	0.0079	--	0.008	--	6	0.0024	0.0000	*
Palladium	µg/m^3	--	--	--	--	--	--	0.0024	0.0000	*
Phosphorus	µg/m^3	--	--	--	--	--	--	0.0045	0.0000	*
Potassium	µg/m^3	--	--	--	--	--	--	0.3112	1.7250	
Rubidium	µg/m^3	--	--	--	--	--	--	0.0009	0.0029	*
Selenium	µg/m^3	500	18.3	--	--	--	--	0.0044	0.0245	
Silicon	µg/m^3	--	--	--	--	--	--	1.31	7.2630	
Silver	µg/m^3	--	--	--	--	--	--	0.0024	0.0000	*
Sodium	µg/m^3	--	--	--	--	--	--	0.0495	0.0010	*
Strontium	µg/m^3	--	--	--	--	--	--	0.0014	0.0076	
Sulfur	µg/m^3	--	--	--	--	--	--	0.4751	2.6330	
Tin	µg/m^3	--	--	--	--	--	--	0.0033	0.0031	*
Titanium	µg/m^3	--	--	--	31	--	--	0.0471	0.2610	
Vanadium	µg/m^3	--	--	--	--	--	--	0.0018	0.0003	*
Yttrium	µg/m^3	--	--	--	--	--	--	0.0015	0.0000	*
Zinc	µg/m^3	--	--	--	--	--	--	0.0217	0.1200	
Zirconium	µg/m^3	--	--	--	--	--	--	0.0018	0.0060	*

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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] Samples are anticipated to be rejected by EPA during validation.
[12] Percent of Total Mass
[13] Precipitation measurements are recorded manually by a Hayden-Winkelman High School employee; reliability cannot be verifie
[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 due to sample volume issues with the instrument.
[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

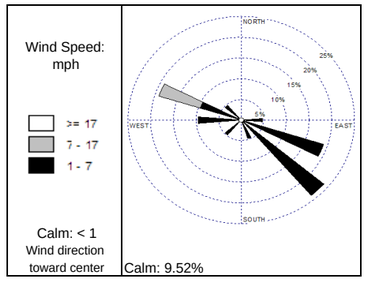

TABLE 2
Air Filter Sampling Laboratory Values for Inorganic Parameters
Winkelman Monitoring Station
Data Evaluation Report
ASARCO LLC Hayden, Arizona Plant Site

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]	1/12/2008			2/17/2008			2/23/08			3/28/08			3/31/08			5/16/08		
Avg Wind Speed (mph):								1.68			2.98			4.91			3.85			3.85			9.26		
Avg Wind Direction (degrees):								281			315			296			326			306			67		
Avg Ambient Temperature (°C):								9.8			9.3			14.2			20.9			17.2			24.9		
Avg Ambient Relative Humidity (%):								19.4			24.0			16.6			6.8			7.1			7.9		
Precipitation (inches)[3]:								NA			NA			NA			NA			NA			NA		
Parameter	**Units**							**Result**	**Percent[11]**	**Qual**	**Result**	**Percent[11]**	**Qual**	**Result**	**Percent[11]**	**Qual**	**Result**	**Percent[11]**	**Qual**	**Result**	**Percent[11]**	**Qual**	**Result**	**Percent[11]**	**Qual**
PM_{10}	µg/m^3	--	--	150 [7]/50 [8]	--	150 [7]	--	17.61	NA		10.44	NA		9.8	NA		2.19	NA		12.47	NA		17.8	NA	
Aluminum	µg/m^3	--	--	--	5.1	--	--	0.1953	1.1290		0.1867	1.8220		0.2025	2.1410		0.0066	0.0000	*	0.3324	2.7990		0.6921	4.1840	
Antimony	µg/m^3	13,000	1.46	--	--	--	--	0.003	0.0144	*	0.0027	0.0041	*	0.0030	0.0174	*	0.0027	0.0161	*	0.0027	0.0000	*	0.0027	0.0000	*
Arsenic	µg/m^3	2,500	0.000441	--	0.00045	--	0.19	**0.0249**	0.1440		**0.0048**	0.0473		**0.0049**	0.0523		0.0009	0.0000	*	***0.0021***	0.0107	*	***0.0024***	0.0151	*
Barium	µg/m^3	--	--	--	0.52	--	--	0.0129	0.0743		0.0042	0.0069	*	0.0048	0.0005	*	0.0036	0.0530	*	0.0054	0.0012	*	0.0072	0.0239	*
Bismuth	µg/m^3	--	--	--	--	--	--	0.0472	0.2728		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA	
Bromine	µg/m^3	--	--	--	--	--	--	0.0018	0.0008	*	0.0014	0.0133		0.0009	0.0095	*	0.0010	0.0484		0.0034	0.0289		0.0018	0.0111	
Cadmium	µg/m^3	250	0.00105	--	0.0011	--	--	***0.0024***	0.0084	*	***0.0024***	0.0000	*	0.0018	0.0000	*	0.0018	0.0000	*	0.0021	0.0000	*	0.0018	0.0003	*
Calcium	µg/m^3	--	--	--	--	--	--	0.2573	1.4880		0.2064	2.0130		0.2365	2.5000		0.0024	0.1176		0.2968	2.4990		0.6408	3.8740	
Chlorine	µg/m^3	--	--	--	--	--	--	0.0135	0.0000	*	0.0051	0.0000	*	0.2168	2.2920		0.0039	0.0000	*	0.1107	0.9322		0.1081	0.6535	
Chromium	µg/m^3	100	0.000158	--	0.00016	--	--	***0.0009***	0.0000	*	***0.0009***	0.0023	*	0.0009	0.0045	*	0.0009	0.0000	*	0.0009	0.0028	*	0.0009	0.0011	*
Cobalt	µg/m^3	10,000	0.000686	--	0.00069	--	--	***0.0087***	0.0000	*	***0.0045***	0.0000	*	0.0045	0.0000	*	0.0027	0.0000	*	0.0051	0.0000	*	0.0066	0.0000	*
Copper	µg/m^3	--	--	--	--	--	100	0.9360	5.4130		0.1093	1.0670		0.0788	0.8333		0.0402	1.1390	*	0.0538	0.4532		0.0761	0.4600	
Gallium	µg/m^3	--	--	--	--	--	--	0.0024	0.0000	*	0.0009	0.0000	*	0.0012	0.0000	*	0.0012	0.0000	*	0.0012	0.0016	*	0.0012	0.0000	*
Germanium	µg/m^3	--	--	--	--	--	--	0.0009	0.0000	*	0.0009	0.0000	*	0.0012	0.0085	*	0.0012	0.0138	*	0.0012	0.0032	*	0.0012	0.0000	*
Indium	µg/m^3	--	--	--	--	--	--	0.0024	0.0000	*	0.0024	0.0000	*	0.0021	0.0000	*	0.0021	0.0023	*	0.0021	0.0000	*	0.0018	0.0000	*
Iron	µg/m^3	--	--	--	--	--	--	0.4438	2.5660		0.1831	1.7860		0.1768	1.8690		0.0048	0.2352		0.2250	1.8950		0.4722	2.8550	
Lanthanum	µg/m^3	--	--	--	--	--	--	0.0051	0.0000	*	0.0045	0.0101	*	0.0075	0.0000	*	0.0030	0.0484	*	0.0090	0.0020	*	0.006	0.0000	*
Lead	µg/m^3	--	--	1.5 [9 10]	--	1.5 [9 10]	--	0.2067	1.1960		0.0181	0.1764		0.0155	0.1643		0.0024	0.0138	*	0.0044	0.0373		0.0101	0.0609	
Magnesium	µg/m^3	--	--	--	--	--	--	0.0249	0.0400	*	0.0342	0.1952	*	0.0429	0.4540		0.0123	0.0000	*	0.0873	0.7351		0.1484	0.8969	
Manganese	µg/m^3	2,500	0.0521	--	0.051	--	--	0.0037	0.0212		0.0019	0.0188		0.0026	0.0274		0.0012	0.0000	*	0.0032	0.0266		0.0096	0.0578	
Mercury	µg/m^3	1,000	0.313	--	0.31	--	1.8	0.0018	0.0000	*	0.0015	0.0000	*	0.0027	0.0134	*	0.0024	0.0092	*	0.0027	0.0059	*	0.0021	0.0000	*
Molybdenum	µg/m^3	--	--	--	--	--	--	0.0079	0.0457		0.0018	0.0041	*	0.0033	0.0080	*	0.0030	0.0669	*	0.0033	0.0000	*	0.005	0.0305	
Nickel	µg/m^3	5,000	0.0079	--	0.008	--	6	0.0015	0.0000	*	0.0019	0.0188		0.0024	0.0000	*	0.0021	0.0000	*	0.0024	0.0000	*	0.0021	0.0074	*
Palladium	µg/m^3	--	--	--	--	--	--	0.0021	0.0000	*	0.0021	0.0000	*	0.0018	0.0000	*	0.0018	0.0115	*	0.0018	0.0000	*	0.0018	0.0023	*
Phosphorus	µg/m^3	--	--	--	--	--	--	0.0048	0.0000	*	0.0036	0.0000	*	0.0033	0.0000	*	0.0024	0.0000	*	0.0039	0.0000	*	0.0039	0.0000	*
Potassium	µg/m^3	--	--	--	--	--	--	0.1426	0.8248		0.0913	0.8911		0.1071	1.1320		0.0021	0.0092	*	0.1072	0.9024		0.2775	1.6780	
Rubidium	µg/m^3	--	--	--	--	--	--	0.0012	0.0071		0.0006	0.0000	*	0.0012	0.0025	*	0.0012	0.0000	*	0.0012	0.0000	*	0.0015	0.0091	
Selenium	µg/m^3	500	18.3	--	--	--	--	0.0100	0.0577		0.0039	0.0377		0.0014	0.0149		0.0009	0.0300	*	0.0009	0.0067	*	0.0009	0.0009	*
Silicon	µg/m^3	--	--	--	--	--	--	0.6173	3.5700		0.5113	4.9890		0.5532	5.8490		0.0048	0.0000	*	0.8367	7.0460		1.806	10.9200	
Silver	µg/m^3	--	--	--	--	--	--	0.0024	0.0084	*	0.0021	0.0000	*	0.0018	0.0000	*	0.0018	0.0115	*	0.0018	0.0056	*	0.0018	0.0028	*
Sodium	µg/m^3	--	--	--	--	--	--	0.1866	1.0550	*	0.1236	0.5880	*	0.2351	2.4860		0.0315	0.2998	*	0.1236	0.8445	*	0.2114	1.2780	
Strontium	µg/m^3	--	--	--	--	--	--	0.0016	0.0090		0.0014	0.0138		0.0027	0.0289		0.0015	0.0000	*	0.0024	0.0206		0.0037	0.0222	
Sulfur	µg/m^3	--	--	--	--	--	--	1.3870	8.0220		0.4422	4.3140		0.2147	2.2700		0.0018	0.0438	*	0.3204	2.6980		0.3056	1.8480	
Tin	µg/m^3	--	--	--	--	--	--	0.0027	0.0030	*	0.003	0.0239	*	0.0030	0.0080	*	0.0030	0.0507	*	0.0030	0.0059	*	0.0024	0.0000	*
Titanium	µg/m^3	--	--	--	31	--	--	0.0193	0.1116		0.0177	0.1727		0.0170	0.1792		0.0009	0.0346	*	0.0214	0.1800		0.0488	0.2952	
Vanadium	µg/m^3	--	--	--	--	--	--	0.0012	0.0000	*	0.0009	0.0000	*	0.0012	0.0015	*	0.0006	0.0208	*	0.0012	0.0028	*	0.0021	0.0000	*
Yttrium	µg/m^3	--	--	--	--	--	--	0.0021	0.0000	*	0.0009	0.0000	*	0.0018	0.0050	*	0.0018	0.0300	*	0.0018	0.0048	*	0.0024	0.0000	*
Zinc	µg/m^3	--	--	--	--	--	--	0.0723	0.4180		0.0137	0.1341		0.0120	0.1269		0.0018	0.0115	*	0.0049	0.0412		0.0128	0.0771	
Zirconium	µg/m^3	--	--	--	--	--	--	0.0012	0.0046	*	0.0012	0.0014	*	0.0024	0.0025	*	0.0021	0.0115	*	0.0024	0.0004	*	0.0018	0.0111	*

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] Percent of Total Mass
[12] Precipitation measurements are recorded manually by a Hayden-Winkelman High School employee; reliability cannot be verified.
[13] Bold values with bold outline indicate the result exceeds one or more of the comparison criteria.
[14] Bold italicized values indicate the non-detected result exceeds one or more of the comparison criteria.
[15] * = The result is less than three times the level of uncertainty which is shown in place of the result.
[16] -- = Not established
[17] °C = Degrees Celsius
[18] % = Percent
[19] J = Estimated value
[20] mph = miles per hour
[21] NA = Not Applicable or Not Analyzed
[22] NPR = No precipitation recorded.
[23] µg/m^3 = Micrograms per cubic meter
[24] PM_{10} = particulate matter with a diameter less than or equal to 10 microns in size
[25] R = Rejected
[26] This table should be considered preliminary and will be revised based on incoming data, final data validation and QA/QC.

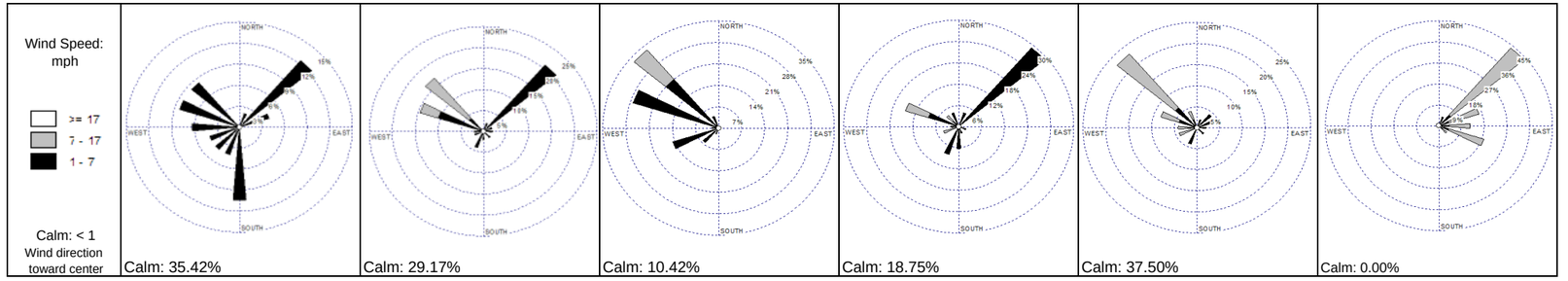

TABLE 2
Air Filter Sampling Laboratory Values for Inorganic Parameters
Winkelman Monitoring Station
Data Evaluation Report
ASARCO LLC Hayden, Arizona Plant Site

Date:								5/19/08			5/22/08			5/28/08			5/31/08			6/9/08			6/12/08		
Avg Wind Speed (mph):								4.97			7.33			5.03			4.04			3.23			4.23		
Avg Wind Direction (degrees):								292			267			310			307			279			302		
Avg Ambient Temperature (°C):								31.1			17.6			25.2			27.3			30.7			29.6		
Avg Ambient Relative Humidity (%):								5.6			22.0			6.9			6.1			5.6			5.7		
Precipitation (inches)[3]:								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[11]**	**Qual**	**Result**	**Percent[11]**	**Qual**	**Result**	**Percent[11]**	**Qual**	**Result**	**Percent[11]**	**Qual**	**Result**	**Percent[11]**	**Qual**	**Result**	**Percent[11]**	**Qual**
PM_{10}	µg/m[3]	--	--	150 [7]/50 [8]	--	150 [7]	--	15.58	NA		26.05	NA		R	NA		24.74	NA		12.45	NA		26.09	NA	
Aluminum	µg/m[3]	--	--	--	5.1	--	--	0.3645	2.5880		0.7491	3.0840		R	R		0.5071	2.2330		0.3562	3.1660		0.8522	3.6460	
Antimony	µg/m[3]	13,000	1.46	--	--	--	--	0.0024	0.0000	*	0.0027	0.0109	*	R	R		0.0033	0.0145		0.0024	0.0000	*	0.003	0.0000	*
Arsenic	µg/m[3]	2,500	0.000441	--	0.00045	--	0.19	**0.0129**	0.0913		**0.0065**	0.0266		R	R		***0.0090***	0.0375	*	**0.0051**	0.0452		**0.0094**	0.0403	
Barium	µg/m[3]	--	--	--	0.52	--	--	0.0048	0.0000	*	0.012	0.0494		R	R		0.0072	0.0309	*	0.0048	0.0000	*	0.0123	0.0526	
Bismuth	µg/m[3]	--	--	--	--	--	--	0.0092	0.0655		0.0061	0.0250		NA	NA		0.0251	0.1107		NA	NA		NA	NA	
Bromine	µg/m[3]	--	--	--	--	--	--	0.0009	0.0033	*	0.0037	0.0153		R	R		0.0056	0.0249		0.0018	0.0159		0.0029	0.0125	
Cadmium	µg/m[3]	250	0.00105	--	0.0011	--	--	0.0018	0.0027	*	0.0018	0.0033	*	R	R		0.0018	0.0073	*	0.0018	0.0000	*	***0.0024***	0.0000	*
Calcium	µg/m[3]	--	--	--	--	--	--	0.3159	2.2430		0.7185	2.9580		R	R		0.4485	1.9750		0.3101	2.7570		0.8395	3.5910	
Chlorine	µg/m[3]	--	--	--	--	--	--	0.0048	0.0000	*	0.0066	0.0240	*	R	R		0.042	0.1849		0.0115	0.1021		0.356	1.5230	
Chromium	µg/m[3]	100	0.000158	--	0.00016	--	--	**0.0029**	0.0204		**0.0021**	0.0087		R	R		***0.0009***	0.0023	*	0.0009	0.0013	*	***0.0012***	0.0042	*
Cobalt	µg/m[3]	10,000	0.000686	--	0.00069	--	--	0.0045	0.0000	*	0.018	0.0000	*	R	R		0.0141	0.0000	*	0.0045	0.0000	*	***0.0174***	0.0000	*
Copper	µg/m[3]	--	--	--	--	--	100	0.1704	1.2100		0.8042	3.3110		R	R		1.09	4.7980		0.1379	1.2250		0.3774	1.6140	
Gallium	µg/m[3]	--	--	--	--	--	--	0.0012	0.0000	*	0.0015	0.0000	*	R	R		0.0018	0.0000	*	0.0015	0.0000	*	0.0012	0.0000	*
Germanium	µg/m[3]	--	--	--	--	--	--	0.0009	0.0020	*	0.0012	0.0000	*	R	R		0.0012	0.0000	*	0.0012	0.0000	*	0.0009	0.0000	*
Indium	µg/m[3]	--	--	--	--	--	--	0.0018	0.0000	*	0.0018	0.0014	*	R	R		0.0018	0.0010	*	0.0018	0.0000	*	0.0024	0.0000	*
Iron	µg/m[3]	--	--	--	--	--	--	0.3048	2.1640		1.457	5.9970		R	R		1.125	4.9530		0.2983	2.6510		0.944	4.0390	
Lanthanum	µg/m[3]	--	--	--	--	--	--	0.0042	0.0000	*	0.0069	0.0000	*	R	R		0.0057	0.0000	*	0.0042	0.0000	*	0.009	0.0000	*
Lead	µg/m[3]	--	--	1.5 [9 10]	--	1.5 [9 10]	--	0.0309	0.2196		0.0375	0.1545		R	R		0.0986	0.4342		0.0227	0.2021		0.0246	0.1053	
Magnesium	µg/m[3]	--	--	--	--	--	--	0.0506	0.3594		0.183	0.7532		R	R		0.1202	0.5291		0.0821	0.7299		0.096	0.4105	
Manganese	µg/m[3]	2,500	0.0521	--	0.051	--	--	0.0048	0.0344		0.0104	0.0428		R	R		0.0077	0.0340		0.0042	0.0372		0.0129	0.0550	
Mercury	µg/m[3]	1,000	0.313	--	0.31	--	1.8	0.0018	0.0094	*	0.0021	0.0000	*	R	R		0.0021	0.0000	*	0.0021	0.0000	*	0.0018	0.0000	*
Molybdenum	µg/m[3]	--	--	--	--	--	--	0.0024	0.0000	*	0.0117	0.0481		R	R		0.0119	0.0525		0.0027	0.0193		0.003	0.0127	
Nickel	µg/m[3]	5,000	0.0079	--	0.008	--	6	0.0021	0.0027	*	0.0024	0.0000	*	R	R		0.0024	0.0000	*	0.0021	0.0029	*	0.0018	0.0000	*
Palladium	µg/m[3]	--	--	--	--	--	--	0.0018	0.0000	*	0.0018	0.0000	*	R	R		0.0021	0.0000	*	0.0018	0.0000	*	0.0021	0.0034	*
Phosphorus	µg/m[3]	--	--	--	--	--	--	0.0036	0.0000	*	0.0052	0.0213		R	R		0.0042	0.0000	*	0.0033	0.0000	*	0.0054	0.0000	*
Potassium	µg/m[3]	--	--	--	--	--	--	0.1659	1.1780		0.3093	1.2730		R	R		0.3361	1.4800		0.1481	1.3160		0.4234	1.8110	
Rubidium	µg/m[3]	--	--	--	--	--	--	0.0009	0.0053	*	0.0016	0.0064		R	R		0.0009	0.0046	*	0.0009	0.0013	*	0.0009	0.0036	*
Selenium	µg/m[3]	500	18.3	--	--	--	--	0.0019	0.0137		0.0035	0.0145		R	R		0.0066	0.0290		0.0009	0.0092	*	0.0011	0.0048	
Silicon	µg/m[3]	--	--	--	--	--	--	0.9506	6.7500		1.974	8.1250		R	R		1.426	6.2800		0.9261	8.2320		2.336	9.9950	
Silver	µg/m[3]	--	--	--	--	--	--	0.0018	0.0007	*	0.0018	0.0002	*	R	R		0.0018	0.0035	*	0.0018	0.0021	*	0.0024	0.0000	*
Sodium	µg/m[3]	--	--	--	--	--	--	0.0447	0.1611	*	0.0573	0.0000	*	R	R		0.1962	0.6301	*	0.1245	0.5449	*	0.3564	1.5250	
Strontium	µg/m[3]	--	--	--	--	--	--	0.0027	0.0194		0.0058	0.0240		R	R		0.0027	0.0118		0.0026	0.0230		0.0077	0.0328	
Sulfur	µg/m[3]	--	--	--	--	--	--	0.5923	4.2060		0.7166	2.9500		R	R		0.8993	3.9600		0.2835	2.5200		0.6799	2.9090	
Tin	µg/m[3]	--	--	--	--	--	--	0.0024	0.0053	*	0.0024	0.0000	*	R	R		0.0024	0.0000	*	0.0024	0.0029	*	0.003	0.0054	*
Titanium	µg/m[3]	--	--	--	31	--	--	0.0234	0.1662		0.0582	0.2396		R	R		0.0444	0.1953		0.0211	0.1879		0.0639	0.2735	
Vanadium	µg/m[3]	--	--	--	--	--	--	0.0012	0.0000	*	0.0024	0.0033	*	R	R		0.0018	0.0019	*	0.0012	0.0000	*	0.0027	0.0000	*
Yttrium	µg/m[3]	--	--	--	--	--	--	0.0024	0.0000	*	0.0024	0.0000	*	R	R		0.0027	0.0000	*	0.0024	0.0000	*	0.0012	0.0000	*
Zinc	µg/m[3]	--	--	--	--	--	--	0.024	0.1705		0.0488	0.2008		R	R		0.0817	0.3597		0.0169	0.1498		0.0255	0.1090	
Zirconium	µg/m[3]	--	--	--	--	--	--	0.0015	0.0053	*	0.0018	0.0060	*	R	R		0.0018	0.0000	*	0.0023	0.0201		0.0015	0.0052	*

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] Percent of Total Mass
[12] Precipitation measurements are recorded manually by a Hayden-Winkelman High School employee; reliability cannot be verified.
[13] Bold values with bold outline indicate the result exceeds one or more of the comparison criteria.
[14] Bold italicized values indicate the non-detected result exceeds one or more of the comparison criteria.
[15] * = The result is less than three times the level of uncertainty which is shown in place of the result.
[16] -- = Not established
[17] °C = Degrees Celsius
[18] % = Percent
[19] J = Estimated value
[20] mph = miles per hour
[21] NA = Not Applicable or Not Analyzed
[22] NPR = No precipitation recorded.
[23] µg/m[3] = Micrograms per cubic meter
[24] PM_{10} = particulate matter with a diameter less than or equal to 10 microns in size
[25] R = Rejected
[26] This table should be considered preliminary and will be revised based on incoming data, final data validation and QA/QC.

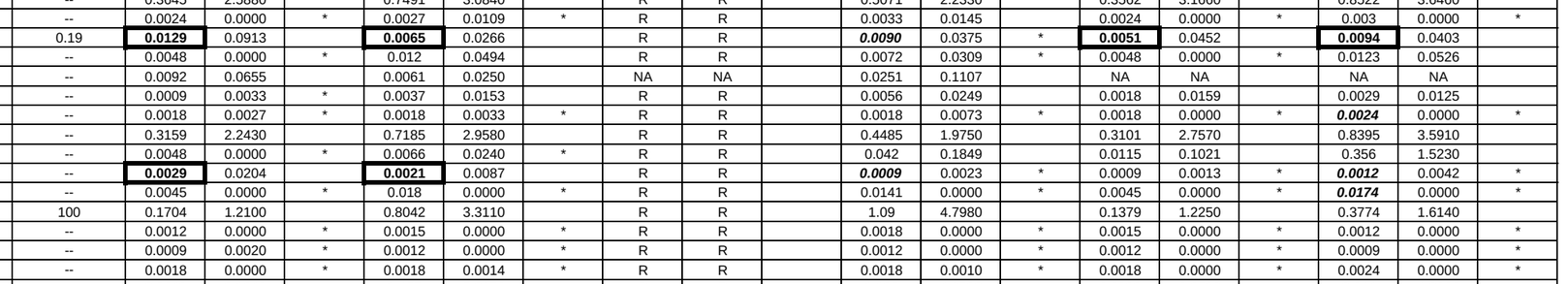

TABLE 2
Air Filter Sampling Laboratory Values for Inorganic Parameters
Winkelman Monitoring Station
Data Evaluation Report
ASARCO LLC Hayden, Arizona Plant Site

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]	6/15/08			6/18/08			6/21/08			6/24/08			6/27/08			6/30/08		
Avg Wind Speed (mph):								4.47			4.97			5.47			4.16			4.16			6.96		
Avg Wind Direction (degrees):								304			293			197			289			291			89		
Avg Ambient Temperature (°C):								33.8			34.2			34.6			34.6			31.4			34.5		
Avg Ambient Relative Humidity (%):								5.3			5.2			5.2			5.2			10.1			5.3		
Precipitation (inches)[3]:								NA			NA			NA			NA			NA			NA		
Parameter	**Units**							**Result**	**Percent[11]**	**Qual**	**Result**	**Percent[11]**	**Qual**	**Result**	**Percent[11]**	**Qual**	**Result**	**Percent[11]**	**Qual**	**Result**	**Percent[11]**	**Qual**	**Result**	**Percent[11]**	**Qual**
PM_{10}	µg/m^3	--	--	150 [7]/50 [8]	--	150 [7]	--	31.39	NA		26.51	NA		34.04	NA		32.37	NA		13.32	NA		11.06	NA	
Aluminum	µg/m^3	--	--	--	5.1	--	--	0.9271	3.2960		0.6154	2.5910		0.9817	3.2190		0.8689	3.0000		0.374	3.1060		0.2798	2.8210	
Antimony	µg/m^3	13,000	1.46	--	--	--	--	0.003	0.0000	*	0.0083	0.0351		0.0062	0.0202		0.0051	0.0177		0.0033	0.0063	*	0.0036	0.0351	*
Arsenic	µg/m^3	2,500	0.000441	--	0.00045	--	0.19	**0.0147**	0.0522		**0.0187**	0.0787		**0.0076**	0.0249		**0.0218**	0.0753		***0.0015***	0.0039	*	***0.0015***	0.0052	*
Barium	µg/m^3	--	--	--	0.52	--	--	0.0159	0.0564		0.0172	0.0726		0.0145	0.0474		0.0141	0.0486		0.0071	0.0590		0.0048	0.0275	*
Bismuth	µg/m^3	--	--	--	--	--	--	0.0129	0.0459		0.0144	0.0607		NA	NA		0.0178	0.0614		NA	NA		NA	NA	
Bromine	µg/m^3	--	--	--	--	--	--	0.0066	0.0236		0.0033	0.0141		0.0028	0.0091		0.0037	0.0126		0.0025	0.0211		0.0015	0.0147	
Cadmium	µg/m^3	250	0.00105	--	0.0011	--	--	***0.0024***	0.0013	*	***0.0027***	0.0040	*	***0.0024***	0.0000	*	***0.0027***	0.0040	*	***0.0024***	0.0000	*	***0.0024***	0.0000	*
Calcium	µg/m^3	--	--	--	--	--	--	0.8673	3.0840		0.5824	2.4520		0.7204	2.3620		0.7394	2.5530		0.3131	2.6000		0.2934	2.9590	
Chlorine	µg/m^3	--	--	--	--	--	--	0.1265	0.4498		0.0164	0.0690		0.0075	0.0211	*	0.0087	0.0163	*	0.0054	0.0000	*	0.0048	0.0000	*
Chromium	µg/m^3	100	0.000158	--	0.00016	--	--	***0.0012***	0.0042	*	**0.0019**	0.0081		***0.0012***	0.0036	*	***0.0012***	0.0020	*	***0.0012***	0.0051	*	***0.0009***	0.0043	*
Cobalt	µg/m^3	10,000	0.000686	--	0.00069	--	--	***0.0171***	0.0000	*	***0.0213***	0.0000	*	***0.0183***	0.0000	*	***0.0159***	0.0000	*	***0.0063***	0.0000	*	***0.0048***	0.0000	*
Copper	µg/m^3	--	--	--	--	--	100	0.2927	1.0410		1.09	4.5910		0.5914	1.9390		0.528	1.8230		0.1085	0.9013		0.0305	0.3072	
Gallium	µg/m^3	--	--	--	--	--	--	0.0012	0.0000	*	0.0015	0.0000	*	0.0012	0.0000	*	0.0015	0.0000	*	0.0012	0.0000	*	0.0012	0.0000	*
Germanium	µg/m^3	--	--	--	--	--	--	0.0009	0.0000	*	0.0012	0.0000	*	0.0012	0.0000	*	0.0012	0.0000	*	0.0009	0.0000	*	0.0009	0.0000	*
Indium	µg/m^3	--	--	--	--	--	--	0.0027	0.0000	*	0.0027	0.0000	*	0.0027	0.0000	*	0.0027	0.0000	*	0.0024	0.0000	*	0.0024	0.0000	*
Iron	µg/m^3	--	--	--	--	--	--	0.9261	3.2930		1.151	4.8470		0.9817	3.2190		0.848	2.9280		0.3029	2.5160		0.2094	2.1110	
Lanthanum	µg/m^3	--	--	--	--	--	--	0.0105	0.0000	*	0.0078	0.0000	*	0.0087	0.0000	*	0.009	0.0000	*	0.0057	0.0000	*	0.0051	0.0014	*
Lead	µg/m^3	--	--	1.5 [9 10]	--	1.5 [9 10]	--	0.0459	0.1631		0.0586	0.2468		0.0264	0.0866		0.0579	0.1999		0.0075	0.0626		0.0032	0.0328	
Magnesium	µg/m^3	--	--	--	--	--	--	0.119	0.4230		0.0675	0.2617	*	0.0399	0.0039	*	0.0849	0.2931		0.0279	0.1247	*	0.0243	0.0000	*
Manganese	µg/m^3	2,500	0.0521	--	0.051	--	--	0.0142	0.0506		0.0081	0.0343		0.0111	0.0364		0.0113	0.0390		0.0038	0.0313		0.0035	0.0356	
Mercury	µg/m^3	1,000	0.313	--	0.31	--	1.8	0.0018	0.0000	*	0.0021	0.0000	*	0.0021	0.0000	*	0.0021	0.0000	*	0.0018	0.0000	*	0.0018	0.0000	*
Molybdenum	µg/m^3	--	--	--	--	--	--	0.004	0.0142		0.0127	0.0533		0.007	0.0228		0.0044	0.0153		0.0021	0.0074	*	0.0021	0.0000	*
Nickel	µg/m^3	5,000	0.0079	--	0.008	--	6	0.0018	0.0027	*	0.0021	0.0000	*	0.0021	0.0040	*	0.0021	0.0000	*	0.0018	0.0063	*	0.0018	0.0119	*
Palladium	µg/m^3	--	--	--	--	--	--	0.0021	0.0000	*	0.0024	0.0000	*	0.0024	0.0012	*	0.0024	0.0000	*	0.0021	0.0000	*	0.0021	0.0000	*
Phosphorus	µg/m^3	--	--	--	--	--	--	0.0057	0.0000	*	0.0057	0.0000	*	0.0057	0.0000	*	0.006	0.0000	*	0.0045	0.0000	*	0.0039	0.0000	*
Potassium	µg/m^3	--	--	--	--	--	--	0.5405	1.9220		0.3485	1.4670		0.441	1.4460		0.4442	1.5340		0.2149	1.7850		0.1343	1.3540	
Rubidium	µg/m^3	--	--	--	--	--	--	0.0024	0.0084		0.0013	0.0054		0.0015	0.0049		0.0024	0.0082		0.0009	0.0051	*	0.001	0.0104	
Selenium	µg/m^3	500	18.3	--	--	--	--	0.0014	0.0050		0.0067	0.0283		0.0009	0.0009	*	0.003	0.0103		0.0009	0.0070	*	0.0009	0.0028	*
Silicon	µg/m^3	--	--	--	--	--	--	2.584	9.1890		1.708	7.1900		2.517	8.2530		2.23	7.6980		0.9789	8.1290		0.7698	7.7630	
Silver	µg/m^3	--	--	--	--	--	--	0.0024	0.0000	*	0.0024	0.0040	*	0.0024	0.0032	*	0.0024	0.0000	*	0.0024	0.0043	*	0.0024	0.0000	*
Sodium	µg/m^3	--	--	--	--	--	--	0.2386	0.8484		0.1749	0.7119	*	0.0648	0.0638	*	0.159	0.3558	*	0.1137	0.7394	*	0.0396	0.0684	*
Strontium	µg/m^3	--	--	--	--	--	--	0.0061	0.0218		0.0038	0.0159		0.0045	0.0147		0.0056	0.0195		0.0024	0.0203		0.0024	0.0242	
Sulfur	µg/m^3	--	--	--	--	--	--	0.75	2.6670		1.144	4.8150		0.6578	2.1570		0.924	3.1900		0.4765	3.9570		0.3483	3.5120	
Tin	µg/m^3	--	--	--	--	--	--	0.003	0.0027	*	0.0033	0.0008	*	0.0033	0.0062	*	0.0033	0.0074	*	0.003	0.0066	*	0.003	0.0024	*
Titanium	µg/m^3	--	--	--	31	--	--	0.0808	0.2874		0.044	0.1852		0.0599	0.1965		0.0624	0.2156		0.0286	0.2373		0.021	0.2118	
Vanadium	µg/m^3	--	--	--	--	--	--	0.0033	0.0000	*	0.0024	0.0000	*	0.0027	0.0000	*	0.0027	0.0000	*	0.0015	0.0051	*	0.0012	0.0000	*
Yttrium	µg/m^3	--	--	--	--	--	--	0.0012	0.0002	*	0.0012	0.0000	*	0.0012	0.0000	*	0.0012	0.0000	*	0.0012	0.0000	*	0.0012	0.0052	*
Zinc	µg/m^3	--	--	--	--	--	--	0.0294	0.1046		0.049	0.2062		0.0267	0.0877		0.0465	0.1604		0.0033	0.0274		0.0032	0.0318	
Zirconium	µg/m^3	--	--	--	--	--	--	0.0015	0.0050	*	0.0015	0.0054	*	0.0015	0.0048	*	0.0015	0.0029	*	0.0012	0.0059	*	0.0015	0.0085	*

Table Notes:
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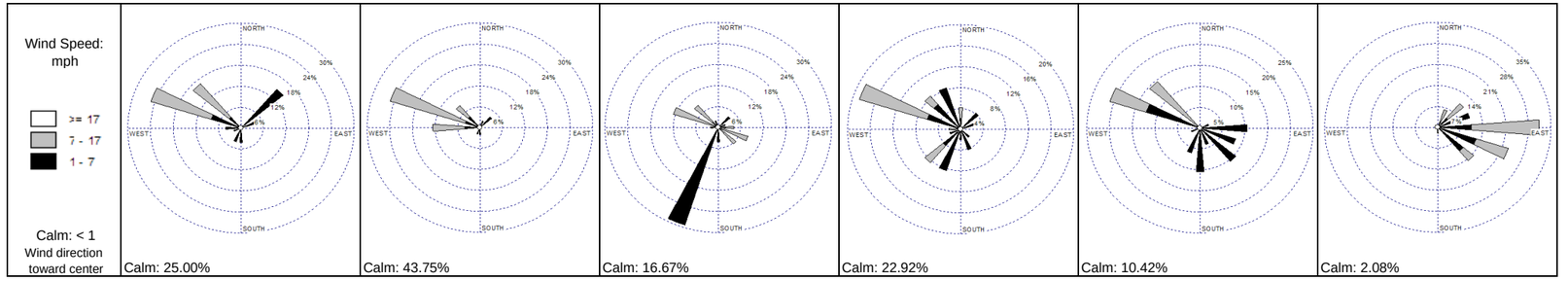

TABLE 2
Air Filter Sampling Laboratory Values for Inorganic Parameters
Winkelman Monitoring Station
Data Evaluation Report
ASARCO LLC Hayden, Arizona Plant Site

Date:								7/3/08			7/6/08			7/9/08			7/12/08			7/15/08			7/21/08		
Avg Wind Speed (mph):								5.03			5.28			4.78			3.23			3.36			2.98		
Avg Wind Direction (degrees):								23			3			112			258			291			177		
Avg Ambient Temperature (°C):								34.2			31.3			29.6			28.8			30.6			29.3		
Avg Ambient Relative Humidity (%):								6.2			13.7			14.9			22.6			18.5			25.5		
Precipitation (inches)[3]:								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[11]**	**Qual**	**Result**	**Percent[11]**	**Qual**	**Result**	**Percent[11]**	**Qual**	**Result**	**Percent[11]**	**Qual**	**Result**	**Percent[11]**	**Qual**	**Result**	**Percent[11]**	**Qual**
PM_{10}	µg/m^3	--	--	150 [7]/50 [8]	--	150 [7]	--	26.58	NA		17.76	NA		6.56	NA		10.33	NA		16.18	NA		7.54	NA	
Aluminum	µg/m^3	--	--	--	5.1	--	--	0.646	2.7200		0.4549	2.8430		0.0931	1.5630		0.1359	1.4370		0.3511	2.3870		0.0568	0.8266	
Antimony	µg/m^3	13,000	1.46	--	--	--	--	0.0033	0.0044	*	0.0027	0.0000	*	0.0027	0.0000	*	0.0024	0.0005	*	0.0024	0.0000	*	0.0024	0.0000	*
Arsenic	µg/m^3	2,500	0.000441	--	0.00045	--	0.19	**0.0073**	0.0305		**0.0048**	0.0300		**0.0012**	0.0198		***0.0021***	0.0144	*	**0.0048**	0.0327		**0.0036**	0.0520	
Barium	µg/m^3	--	--	--	0.52	--	--	0.0095	0.0400		0.0066	0.0062	*	0.0039	0.0332	*	0.0042	0.0124	*	0.0051	0.0003	*	0.0036	0.0000	*
Bismuth	µg/m^3	--	--	--	--	--	--	0.0081	0.0339		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA	
Bromine	µg/m^3	--	--	--	--	--	--	0.0032	0.0137		0.0026	0.0162		0.0009	0.0111	*	0.0024	0.0249		0.0038	0.0256		0.0009	0.0116	*
Cadmium	µg/m^3	250	0.00105	--	0.0011	--	--	***0.0024***	0.0000	*	***0.0018***	0.0000	*	***0.0018***	0.0000	*	***0.0018***	0.0000	*	***0.0018***	0.0000	*	***0.0018***	0.0027	*
Calcium	µg/m^3	--	--	--	--	--	--	0.5174	2.1790		0.3937	2.4610		0.0845	1.4180		0.1666	1.7610		0.3133	2.1300		0.0583	0.8485	
Chlorine	µg/m^3	--	--	--	--	--	--	0.0087	0.0365		0.0054	0.0188	*	0.0042	0.0000	*	0.0048	0.0000	*	0.0051	0.0000	*	0.0039	0.0247	*
Chromium	µg/m^3	100	0.000158	--	0.00016	--	--	***0.0012***	0.0048	*	***0.0009***	0.0044	*	***0.0009***	0.0000	*	***0.0009***	0.0000	*	***0.0009***	0.0054	*	***0.0009***	0.0000	*
Cobalt	µg/m^3	10,000	0.000686	--	0.00069	--	--	***0.0129***	0.0000	*	***0.0054***	0.0000	*	***0.0027***	0.0000	*	***0.0033***	0.0000	*	***0.0048***	0.0000	*	***0.0027***	0.0000	*
Copper	µg/m^3	--	--	--	--	--	100	0.3802	1.6010		0.0961	0.6006		0.0203	0.3406		0.0529	0.5590		0.2044	1.3900		0.0384	0.5582	
Gallium	µg/m^3	--	--	--	--	--	--	0.0012	0.0000	*	0.0012	0.0000	*	0.0012	0.0103	*	0.0012	0.0000	*	0.0012	0.0000	*	0.0012	0.0000	*
Germanium	µg/m^3	--	--	--	--	--	--	0.0009	0.0000	*	0.0012	0.0000	*	0.0012	0.0087	*	0.0012	0.0005	*	0.0009	0.0000	*	0.0012	0.0034	*
Indium	µg/m^3	--	--	--	--	--	--	0.0024	0.0000	*	0.0018	0.0012	*	0.0018	0.0000	*	0.0018	0.0000	*	0.0018	0.0000	*	0.0018	0.0000	*
Iron	µg/m^3	--	--	--	--	--	--	0.6827	2.8750		0.3754	2.3460		0.0694	1.1640		0.1487	1.5730		0.3483	2.3680		0.0621	0.9026	
Lanthanum	µg/m^3	--	--	--	--	--	--	0.0078	0.0000	*	0.0057	0.0024	*	0.0027	0.0119	*	0.003	0.0159	*	0.0045	0.0045	*	0.0021	0.0068	*
Lead	µg/m^3	--	--	1.5 [9 10]	--	1.5 [9 10]	--	0.0294	0.1239		0.0141	0.0883		0.0027	0.0190	*	0.0067	0.0712		0.0175	0.1191		0.01	0.1452	
Magnesium	µg/m^3	--	--	--	--	--	--	0.0363	0.0852	*	0.0583	0.3643		0.0345	0.3580	*	0.0414	0.3256	*	0.0869	0.5906		0.0141	0.0000	*
Manganese	µg/m^3	2,500	0.0521	--	0.051	--	--	0.0082	0.0347		0.0058	0.0362		0.0012	0.0150	*	0.0017	0.0179		0.0044	0.0301		0.0012	0.0082	*
Mercury	µg/m^3	1,000	0.313	--	0.31	--	1.8	0.0018	0.0000	*	0.0021	0.0024	*	0.0021	0.0190	*	0.0021	0.0000	*	0.0021	0.0000	*	0.0021	0.0021	*
Molybdenum	µg/m^3	--	--	--	--	--	--	0.0044	0.0184		0.003	0.0112	*	0.0027	0.0071	*	0.0027	0.0065	*	0.0031	0.0208		0.0027	0.0158	*
Nickel	µg/m^3	5,000	0.0079	--	0.008	--	6	0.0018	0.0036	*	0.0021	0.0000	*	0.0021	0.0000	*	0.0021	0.0000	*	0.0021	0.0064	*	0.0021	0.0000	*
Palladium	µg/m^3	--	--	--	--	--	--	0.0021	0.0000	*	0.0018	0.0000	*	0.0018	0.0055	*	0.0018	0.0000	*	0.0018	0.0000	*	0.0018	0.0000	*
Phosphorus	µg/m^3	--	--	--	--	--	--	0.0054	0.0000	*	0.0042	0.0238	*	0.003	0.0498	*	0.0039	0.0368	*	0.0054	0.0365		0.007	0.1020	
Potassium	µg/m^3	--	--	--	--	--	--	0.3527	1.4850		0.2431	1.5200		0.0503	0.8439		0.1177	1.2440		0.2294	1.5600		0.0546	0.7937	
Rubidium	µg/m^3	--	--	--	--	--	--	0.0016	0.0069		0.0012	0.0074	*	0.0009	0.0000	*	0.0009	0.0010	*	0.0009	0.0000	*	0.0009	0.0000	*
Selenium	µg/m^3	500	18.3	--	--	--	--	0.0023	0.0095		0.0009	0.0053	*	0.0011	0.0182		0.0012	0.0124		0.0025	0.0170		0.0016	0.0240	
Silicon	µg/m^3	--	--	--	--	--	--	1.675	7.0540		1.119	6.9920		0.2219	3.7230		0.3871	4.0920		1.003	6.8220		0.1386	2.0160	
Silver	µg/m^3	--	--	--	--	--	--	0.0024	0.0000	*	0.0018	0.0000	*	0.0018	0.0000	*	0.0018	0.0000	*	0.0018	0.0038	*	0.0018	0.0000	*
Sodium	µg/m^3	--	--	--	--	--	--	0.213	0.8967		0.1509	0.7754	*	0.0357	0.2300	*	0.1733	1.8320		0.1515	0.9437	*	0.1002	0.4746	*
Strontium	µg/m^3	--	--	--	--	--	--	0.0036	0.0151		0.0027	0.0168		0.0012	0.0063	*	0.0012	0.0129	*	0.002	0.0138		0.0012	0.0000	*
Sulfur	µg/m^3	--	--	--	--	--	--	0.847	3.5660		0.6239	3.8990		0.2364	3.9680		0.6352	6.7150		0.7284	4.9520		0.316	4.5960	
Tin	µg/m^3	--	--	--	--	--	--	0.003	0.0042	*	0.0024	0.0000	*	0.0024	0.0024	*	0.0024	0.0000	*	0.0024	0.0000	*	0.0027	0.0226	*
Titanium	µg/m^3	--	--	--	31	--	--	0.0531	0.2236		0.0446	0.2790		0.0097	0.1628		0.0129	0.1369		0.0273	0.1853		0.0039	0.0568	
Vanadium	µg/m^3	--	--	--	--	--	--	0.0024	0.0012	*	0.0018	0.0012	*	0.0009	0.0016	*	0.0011	0.0114		0.0012	0.0000	*	0.0006	0.0014	*
Yttrium	µg/m^3	--	--	--	--	--	--	0.0012	0.0000	*	0.0015	0.0015	*	0.0015	0.0000	*	0.0015	0.0000	*	0.0015	0.0000	*	0.0015	0.0000	*
Zinc	µg/m^3	--	--	--	--	--	--	0.0173	0.0730		0.0134	0.0836		0.0036	0.0601		0.0054	0.0572		0.0107	0.0730		0.0094	0.1370	
Zirconium	µg/m^3	--	--	--	--	--	--	0.0016	0.0067		0.0018	0.0077	*	0.0018	0.0000	*	0.0018	0.0000	*	0.0018	0.0013	*	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] Percent of Total Mass
[12] Precipitation measurements are recorded manually by a Hayden-Winkelman High School employee; reliability cannot be verified.
[13] Bold values with bold outline indicate the result exceeds one or more of the comparison criteria.
[14] Bold italicized values indicate the non-detected result exceeds one or more of the comparison criteria.
[15] * = The result is less than three times the level of uncertainty which is shown in place of the result.
[16] -- = Not established
[17] °C = Degrees Celsius
[18] % = Percent
[19] J = Estimated value
[20] mph = miles per hour
[21] NA = Not Applicable or Not Analyzed
[22] NPR = No precipitation recorded.
[23] µg/m^3 = Micrograms per cubic meter
[24] PM_{10} = particulate matter with a diameter less than or equal to 10 microns in size
[25] R = Rejected
[26] This table should be considered preliminary and will be revised based on incoming data, final data validation and QA/QC.

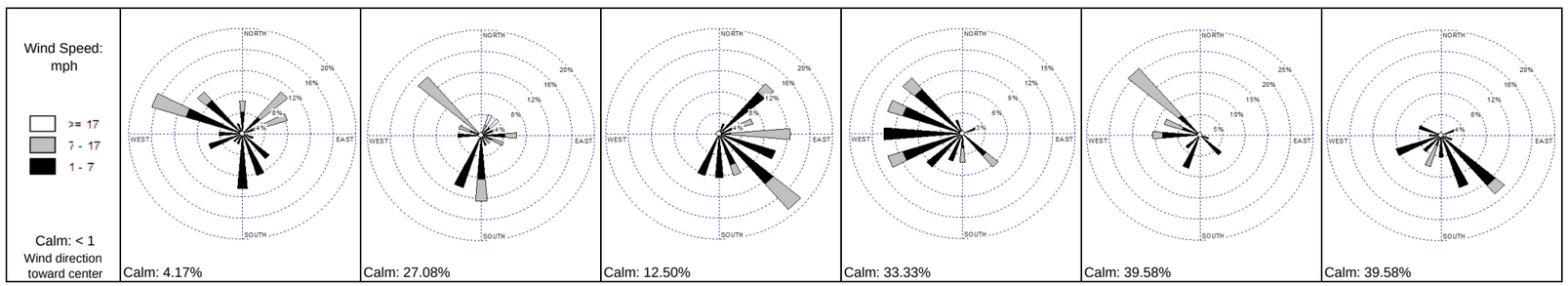

TABLE 2
Air Filter Sampling Laboratory Values for Inorganic Parameters
Winkelman Monitoring Station
Data Evaluation Report
ASARCO LLC Hayden, Arizona Plant Site

Date:								7/24/08			7/27/08			7/30/08			8/2/08			8/5/08			8/8/08		
Avg Wind Speed (mph):								3.60			5.16			3.98			4.66			4.29			5.10		
Avg Wind Direction (degrees):								194			298			294			300			94			280		
Avg Ambient Temperature (°C):								32.1			31.8			31.7			33.4			31.0			30.2		
Avg Ambient Relative Humidity (%):								11.6			7.9			6.7			10.3			14.3			12.6		
Precipitation (inches)[3]:								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[11]**	**Qual**	**Result**	**Percent[11]**	**Qual**	**Result**	**Percent[11]**	**Qual**	**Result**	**Percent[11]**	**Qual**	**Result**	**Percent[11]**	**Qual**	**Result**	**Percent[11]**	**Qual**
PM_{10}	µg/m^3	--	--	150 [7]/50 [8]	--	150 [7]	--	12.61	NA		19.92	NA		19.42	NA		21.55	NA		20.04	NA		27.41	NA	
Aluminum	µg/m^3	--	--	--	5.1	--	--	0.1904	1.6730		0.4661	2.5840		0.5457	3.1110		0.4831	2.4990		0.4817	2.6510		1.002	4.0230	
Antimony	µg/m^3	13,000	1.46	--	--	--	--	0.0027	0.0149	*	0.0024	0.0021	*	0.0027	0.0072	*	0.0027	0.0037	*	0.0107	0.0588		0.0078	0.0312	
Arsenic	µg/m^3	2,500	0.000441	--	0.00045	--	0.19	**0.0162**	0.1428		**0.0028**	0.0154		**0.0065**	0.0368		**0.0212**	0.1096		**0.03**	0.1651		**0.0039**	0.0157	
Barium	µg/m^3	--	--	--	0.52	--	--	0.0051	0.0000	*	0.0063	0.0000	*	0.0066	0.0319	*	0.006	0.0268	*	0.0078	0.0000	*	0.0084	0.0300	*
Bismuth	µg/m^3	--	--	--	--	--	--	0.0292	0.2570		NA	NA		NA	NA		0.0168	0.0869		0.0316	0.1742		NA	NA	
Bromine	µg/m^3	--	--	--	--	--	--	0.0009	0.0075	*	0.0027	0.0149		0.0033	0.0191		0.0034	0.0175		0.0012	0.0054	*	0.0021	0.0083	
Cadmium	µg/m^3	250	0.00105	--	0.0011	--	--	***0.0018***	0.0116	*	***0.0018***	0.0000	*	***0.0018***	0.0000	*	***0.0018***	0.0061	*	***0.0027***	0.0088	*	0.0024	0.0000	*
Calcium	µg/m^3	--	--	--	--	--	--	0.2364	2.0780		0.3503	1.9410		0.5306	3.0250		0.4702	2.4320		0.5259	2.8950		0.6634	2.6620	
Chlorine	µg/m^3	--	--	--	--	--	--	0.0054	0.0000	*	0.3026	1.6770		0.2089	1.1910		0.0427	0.2209		0.009	0.0000	*	0.0099	0.0397	
Chromium	µg/m^3	100	0.000158	--	0.00016	--	--	***0.0009***	0.0000	*	***0.0009***	0.0000	*	***0.0009***	0.0030	*	***0.0009***	0.0017	*	***0.0012***	0.0039	*	0.0012	0.0004	*
Cobalt	µg/m^3	10,000	0.000686	--	0.00069	--	--	***0.0048***	0.0000	*	***0.0054***	0.0000	*	***0.0069***	0.0000	*	***0.0057***	0.0000	*	0.009	0.0000	*	0.0126	0.0000	*
Copper	µg/m^3	--	--	--	--	--	100	0.2857	2.5110		0.0864	0.4786		0.2668	1.5210		0.157	0.8119		0.176	0.9691		0.0886	0.3556	
Gallium	µg/m^3	--	--	--	--	--	--	0.0015	0.0000	*	0.0012	0.0000	*	0.0015	0.0000	*	0.0012	0.0000	*	0.0015	0.0000	*	0.0012	0.0000	*
Germanium	µg/m^3	--	--	--	--	--	--	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/m^3	--	--	--	--	--	--	0.0018	0.0000	*	0.0018	0.0000	*	0.0018	0.0000	*	0.0018	0.0017	*	0.0027	0.0000	*	0.0027	0.0000	*
Iron	µg/m^3	--	--	--	--	--	--	0.3227	2.8370		0.3816	2.1150		0.5047	2.8770		0.4271	2.2090		0.4703	2.5890		0.7067	2.8360	
Lanthanum	µg/m^3	--	--	--	--	--	--	0.0045	0.0000	*	0.0054	0.0037	*	0.0054	0.0000	*	0.0051	0.0000	*	0.0081	0.0000	*	0.0084	0.0000	*
Lead	µg/m^3	--	--	1.5 [9 10]	--	1.5 [9 10]	--	0.0721	0.6337		0.0089	0.0493		0.0261	0.1490		0.0349	0.1807		0.0718	0.3955		0.01	0.0401	
Magnesium	µg/m^3	--	--	--	--	--	--	0.0195	0.0799	*	0.112	0.6206		0.0926	0.5280		0.0594	0.2781	*	0.0552	0.2239	*	0.1582	0.6351	
Manganese	µg/m^3	2,500	0.0521	--	0.051	--	--	0.0032	0.0281		0.0075	0.0415		0.0079	0.0448		0.0071	0.0365		0.0066	0.0363		0.0118	0.0472	
Mercury	µg/m^3	1,000	0.313	--	0.31	--	1.8	0.0021	0.0000	*	0.0021	0.0000	*	0.0021	0.0000	*	0.0021	0.0000	*	0.0021	0.0000	*	0.0021	0.0000	*
Molybdenum	µg/m^3	--	--	--	--	--	--	0.0078	0.0687		0.0027	0.0112	*	0.0034	0.0196		0.0049	0.0253		0.0024	0.0132		0.0021	0.0026	*
Nickel	µg/m^3	5,000	0.0079	--	0.008	--	6	0.0021	0.0050	*	0.0021	0.0089	*	0.0024	0.0113	*	0.0021	0.0058	*	0.0021	0.0060	*	0.0021	0.0000	*
Palladium	µg/m^3	--	--	--	--	--	--	0.0018	0.0021	*	0.0018	0.0005	*	0.0018	0.0000	*	0.0018	0.0000	*	0.0024	0.0000	*	0.0024	0.0042	*
Phosphorus	µg/m^3	--	--	--	--	--	--	0.0039	0.0248	*	0.0039	0.0000	*	0.0039	0.0000	*	0.0045	0.0200	*	0.0051	0.0000	*	0.0054	0.0000	*
Potassium	µg/m^3	--	--	--	--	--	--	0.1106	0.9723		0.2759	1.5290		0.2664	1.5180		0.3342	1.7290		0.248	1.3650		0.4264	1.7110	
Rubidium	µg/m^3	--	--	--	--	--	--	0.0009	0.0079	*	0.0009	0.0039	*	0.0016	0.0094		0.0016	0.0080		0.0014	0.0075		0.0015	0.0060	
Selenium	µg/m^3	500	18.3	--	--	--	--	0.007	0.0617		0.0009	0.0023	*	0.0009	0.0056	*	0.0048	0.0246		0.0021	0.0117		0.0009	0.0011	*
Silicon	µg/m^3	--	--	--	--	--	--	0.5222	4.5900		1.286	7.1300		1.451	8.2720		1.238	6.4030		1.252	6.8910		2.731	10.9600	
Silver	µg/m^3	--	--	--	--	--	--	0.0018	0.0058	*	0.0018	0.0000	*	0.0018	0.0000	*	0.0018	0.0000	*	0.0024	0.0000	*	0.0024	0.0002	*
Sodium	µg/m^3	--	--	--	--	--	--	0.0444	0.0000	*	0.5867	3.2520		0.3071	1.7510		0.1752	0.8940	*	0.0561	0.1762	*	0.0582	0.0877	*
Strontium	µg/m^3	--	--	--	--	--	--	0.0018	0.0161		0.0031	0.0172		0.006	0.0344		0.004	0.0205		0.0034	0.0189		0.0038	0.0153	
Sulfur	µg/m^3	--	--	--	--	--	--	0.7915	6.9580		0.7985	4.4260		0.5363	3.0570		0.7929	4.1010		0.8296	4.5670		0.4835	1.9410	
Tin	µg/m^3	--	--	--	--	--	--	0.0041	0.0360		0.0027	0.0057	*	0.0027	0.0140	*	0.0042	0.0217		0.0033	0.0008	*	0.0033	0.0000	*
Titanium	µg/m^3	--	--	--	31	--	--	0.0266	0.2335		0.0341	0.1892		0.039	0.2225		0.0339	0.1751		0.0631	0.3476		0.0693	0.2780	
Vanadium	µg/m^3	--	--	--	--	--	--	0.0012	0.0000	*	0.0024	0.0136		0.0018	0.0008	*	0.0015	0.0080	*	0.0024	0.0000	*	0.0024	0.0034	*
Yttrium	µg/m^3	--	--	--	--	--	--	0.0015	0.0075	*	0.0015	0.0050	*	0.0015	0.0038	*	0.0015	0.0000	*	0.0012	0.0000	*	0.0012	0.0000	*
Zinc	µg/m^3	--	--	--	--	--	--	0.0412	0.3622		0.0051	0.0284		0.0178	0.1015		0.0211	0.1093		0.0326	0.1796		0.0088	0.0353	
Zirconium	µg/m^3	--	--	--	--	--	--	0.0018	0.0145	*	0.0018	0.0042	*	0.0018	0.0046	*	0.0018	0.0002	*	0.0017	0.0093		0.0026	0.0106	

Table Notes:

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[11] Percent of Total Mass
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[22] NPR = No precipitation recorded.
[23] µg/m^3 = Micrograms per cubic meter
[24] PM_{10} = particulate matter with a diameter less than or equal to 10 microns in size
[25] R = Rejected
[26] This table should be considered preliminary and will be revised based on incoming data, final data validation and QA/QC.

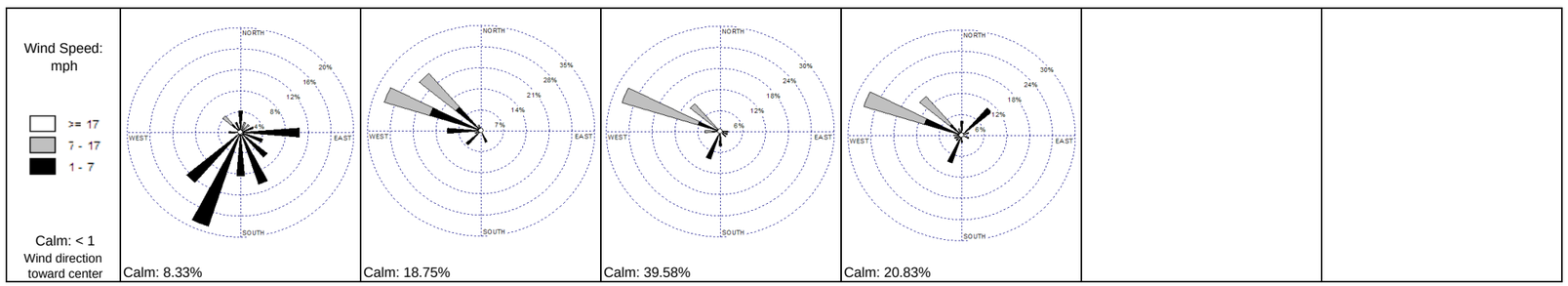

TABLE 2
Air Filter Sampling Laboratory Values for Inorganic Parameters
Winkelman Monitoring Station
Data Evaluation Report
ASARCO LLC Hayden, Arizona Plant Site

Date:								8/11/08			8/14/08			8/17/08			8/20/08			8/23/08			8/29/08		
Avg Wind Speed (mph):								4.47			4.10			4.72			2.80			3.48			4.60		
Avg Wind Direction (degrees):								307			168			308			254			225			98		
Avg Ambient Temperature (°C):								33.0			28.4			30.7			31.2			31.0			30.6		
Avg Ambient Relative Humidity (%):								7.8			20.9			9.1			9.5			10.3			13.2		
Precipitation (inches)[3]:								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[11]**	**Qual**	**Result**	**Percent[11]**	**Qual**	**Result**	**Percent[11]**	**Qual**	**Result**	**Percent[11]**	**Qual**	**Result**	**Percent[11]**	**Qual**	**Result**	**Percent[11]**	**Qual**
PM_{10}	µg/m^3	--	--	150 [7]/50 [8]	--	150 [7]	--	21.24	NA		8.61	NA		14.71	NA		17.46	NA		16.38	NA		9.26	NA	
Aluminum	µg/m^3	--	--	--	5.1	--	--	0.5287	2.7710		0.0961	1.2210		0.2171	1.6290		0.3788	2.4050		0.2523	1.7010		0.0756	0.9029	
Antimony	µg/m^3	13,000	1.46	--	--	--	--	0.0168	0.0878		0.0133	0.1686		0.0113	0.0851		0.0055	0.0347		0.0027	0.0000	*	0.0027	0.0107	*
Arsenic	µg/m^3	2,500	0.000441	--	0.00045	--	0.19	**0.0084**	0.0442		**0.0062**	0.0789		**0.0149**	0.1116		**0.0076**	0.0484		**0.0092**	0.0622		0.0012	0.0000	*
Barium	µg/m^3	--	--	--	0.52	--	--	0.0094	0.0493		0.0048	0.0251	*	0.0048	0.0007	*	0.0057	0.0344	*	0.0036	0.0060	*	0.0024	0.0000	*
Bismuth	µg/m^3	--	--	--	--	--	--	NA	NA		NA	NA		0.0166	0.1247		0.0099	0.0628		NA	NA		NA	NA	
Bromine	µg/m^3	--	--	--	--	--	--	0.0023	0.0121		0.0009	0.0066	*	0.0011	0.0085		0.001	0.0063		0.0015	0.0102		0.0009	0.0000	*
Cadmium	µg/m^3	250	0.00105	--	0.0011	--	--	0.0024	0.0000	*	0.0024	0.0000	*	0.0024	0.0039	*	0.0024	0.0000	*	0.0018	0.0051	*	0.0018	0.0000	*
Calcium	µg/m^3	--	--	--	--	--	--	0.5273	2.7630		0.1046	1.3280		0.1404	1.0530		0.3108	1.9740		0.2941	1.9830		0.1268	1.5150	
Chlorine	µg/m^3	--	--	--	--	--	--	0.014	0.0735		0.0066	0.0042	*	0.0081	0.0053	*	0.0095	0.0601		0.0855	0.5761		0.0036	0.0000	*
Chromium	µg/m^3	100	0.000158	--	0.00016	--	--	0.0012	0.0000	*	0.0012	0.0000	*	0.0012	0.0000	*	0.0012	0.0000	*	0.0006	0.0000	*	0.0006	0.0000	*
Cobalt	µg/m^3	10,000	0.000686	--	0.00069	--	--	0.0105	0.0000	*	0.0042	0.0000	*	0.0054	0.0000	*	0.0066	0.0000	*	0.0036	0.0000	*	0.0024	0.0000	*
Copper	µg/m^3	--	--	--	--	--	100	0.2828	1.4820		0.1613	2.0480		0.1783	1.3370		0.1312	0.8332		0.0939	0.6329		0.0081	0.0967	
Gallium	µg/m^3	--	--	--	--	--	--	0.0015	0.0000	*	0.0015	0.0000	*	0.0015	0.0000	*	0.0012	0.0000	*	0.0018	0.0000	*	0.0015	0.0000	*
Germanium	µg/m^3	--	--	--	--	--	--	0.0012	0.0000	*	0.0012	0.0000	*	0.0012	0.0000	*	0.0012	0.0000	*	0.0012	0.0000	*	0.0012	0.0039	*
Indium	µg/m^3	--	--	--	--	--	--	0.0027	0.0000	*	0.0027	0.0000	*	0.0027	0.0060	*	0.0027	0.0000	*	0.0021	0.0000	*	0.0018	0.0000	*
Iron	µg/m^3	--	--	--	--	--	--	0.5603	2.9360		0.1415	1.7970		0.2366	1.7740		0.3362	2.1350		0.222	1.4970		0.0569	0.6797	
Lanthanum	µg/m^3	--	--	--	--	--	--	0.0084	0.0000	*	0.0051	0.0000	*	0.0048	0.0000	*	0.0057	0.0000	*	0.0039	0.0013	*	0.0018	0.0129	*
Lead	µg/m^3	--	--	1.5 [9 10]	--	1.5 [9 10]	--	0.0354	0.1855		0.0266	0.3378		0.053	0.3973		0.028	0.1779		0.0306	0.2063		0.003	0.0135	*
Magnesium	µg/m^3	--	--	--	--	--	--	0.062	0.3249		0.021	0.1004	*	0.0252	0.0099	*	0.0483	0.2302	*	0.0603	0.4066		0.0297	0.2232	*
Manganese	µg/m^3	2,500	0.0521	--	0.051	--	--	0.0067	0.0353		0.0017	0.0215		0.0025	0.0187		0.0047	0.0299		0.0038	0.0257		0.0009	0.0062	*
Mercury	µg/m^3	1,000	0.313	--	0.31	--	1.8	0.0021	0.0000	*	0.0021	0.0000	*	0.0021	0.0000	*	0.0021	0.0000	*	0.0027	0.0000	*	0.0024	0.0045	*
Molybdenum	µg/m^3	--	--	--	--	--	--	0.0034	0.0180		0.0024	0.0066	*	0.0034	0.0258		0.0021	0.0126	*	0.003	0.0102	*	0.0027	0.0112	*
Nickel	µg/m^3	5,000	0.0079	--	0.008	--	6	0.0021	0.0020	*	0.0021	0.0155	*	0.0026	0.0194		0.0022	0.0138		0.0027	0.0127	*	0.0024	0.0129	*
Palladium	µg/m^3	--	--	--	--	--	--	0.0024	0.0000	*	0.0024	0.0000	*	0.0024	0.0000	*	0.0021	0.0000	*	0.0021	0.0000	*	0.0021	0.0000	*
Phosphorus	µg/m^3	--	--	--	--	--	--	0.0051	0.0000	*	0.0039	0.0000	*	0.0045	0.0000	*	0.0045	0.0000	*	0.0033	0.0187	*	0.0033	0.0399	
Potassium	µg/m^3	--	--	--	--	--	--	0.2783	1.4580		0.0807	1.0240		0.1385	1.0390		0.1972	1.2520		0.1616	1.0900		0.0459	0.5476	
Rubidium	µg/m^3	--	--	--	--	--	--	0.0009	0.0049	*	0.0009	0.0000	*	0.0009	0.0046	*	0.0009	0.0042	*	0.0012	0.0041	*	0.0012	0.0073	*
Selenium	µg/m^3	500	18.3	--	--	--	--	0.0014	0.0074		0.0025	0.0317		0.0036	0.0268		0.0022	0.0141		0.0022	0.0146		0.0009	0.0079	*
Silicon	µg/m^3	--	--	--	--	--	--	1.404	7.3550		0.2751	3.4930		0.678	5.0850		1.029	6.5350		0.6813	4.5930		0.2087	2.4920	
Silver	µg/m^3	--	--	--	--	--	--	0.0024	0.0000	*	0.0024	0.0000	*	0.0024	0.0000	*	0.0024	0.0000	*	0.0021	0.0000	*	0.0018	0.0000	*
Sodium	µg/m^3	--	--	--	--	--	--	0.2688	1.4090		0.0396	0.0132	*	0.1191	0.8870	*	0.1125	0.4374	*	0.2223	1.4990		0.0876	0.3784	*
Strontium	µg/m^3	--	--	--	--	--	--	0.0046	0.0242		0.0009	0.0066	*	0.0009	0.0064	*	0.0024	0.0149		0.0021	0.0140		0.0016	0.0186	
Sulfur	µg/m^3	--	--	--	--	--	--	0.8103	4.2460		0.3603	4.5750		0.7091	5.3180		0.6384	4.0540		0.6375	4.2980		0.4488	5.3590	
Tin	µg/m^3	--	--	--	--	--	--	0.0036	0.0047	*	0.0033	0.0078	*	0.0036	0.0148	*	0.0033	0.0012	*	0.0027	0.0044	*	0.0024	0.0000	*
Titanium	µg/m^3	--	--	--	31	--	--	0.0665	0.3486		0.0179	0.2272		0.0148	0.1109		0.031	0.1970		0.025	0.1685		0.0059	0.0703	
Vanadium	µg/m^3	--	--	--	--	--	--	0.0024	0.0101	*	0.0012	0.0036	*	0.0012	0.0000	*	0.0015	0.0030	*	0.0012	0.0000	*	0.0006	0.0000	*
Yttrium	µg/m^3	--	--	--	--	--	--	0.0012	0.0000	*	0.0012	0.0000	*	0.0012	0.0000	*	0.0012	0.0000	*	0.0018	0.0000	*	0.0018	0.0000	*
Zinc	µg/m^3	--	--	--	--	--	--	0.0218	0.1142		0.0131	0.1668		0.0294	0.2204		0.0152	0.0963		0.0172	0.1162		0.0027	0.0214	*
Zirconium	µg/m^3	--	--	--	--	--	--	0.0019	0.0101		0.0015	0.0042	*	0.0015	0.0042	*	0.0015	0.0057	*	0.0021	0.0029	*	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
[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] Percent of Total Mass
[12] Precipitation measurements are recorded manually by a Hayden-Winkelman High School employee; reliability cannot be verified.
[13] Bold values with bold outline indicate the result exceeds one or more of the comparison criteria.
[14] Bold italicized values indicate the non-detected result exceeds one or more of the comparison criteria.
[15] * = The result is less than three times the level of uncertainty which is shown in place of the result.
[16] -- = Not established
[17] °C = Degrees Celsius
[18] % = Percent
[19] J = Estimated value
[20] mph = miles per hour
[21] NA = Not Applicable or Not Analyzed
[22] NPR = No precipitation recorded.
[23] µg/m^3 = Micrograms per cubic meter
[24] PM_{10} = particulate matter with a diameter less than or equal to 10 microns in size
[25] R = Rejected
[26] This table should be considered preliminary and will be revised based on incoming data, final data validation and QA/QC.

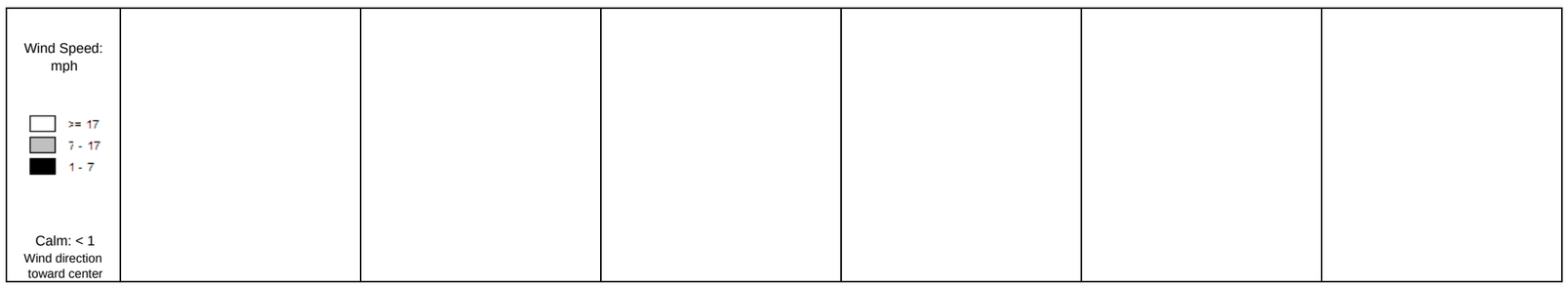

TABLE 2
Air Filter Sampling Laboratory Values for Inorganic Parameters
Winkelman Monitoring Station
Data Evaluation Report
ASARCO LLC Hayden, Arizona Plant Site

Date:								9/1/08			9/4/08			9/7/08			9/12/08			9/18/08			9/24/08		
Avg Wind Speed (mph):								2.61			2.61			3.60			3.36			3.11			4.35		
Avg Wind Direction (degrees):								249			208			120			274			218			119		
Avg Ambient Temperature (°C):								27.4			29.9			30.2			25.4			27.9			30.2		
Avg Ambient Relative Humidity (%):								23.2			11.1			6.5			17.8			7.4			6.0		
Precipitation (inches)[3]:								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[11]**	**Qual**	**Result**	**Percent[11]**	**Qual**	**Result**	**Percent[11]**	**Qual**	**Result**	**Percent[11]**	**Qual**	**Result**	**Percent[11]**	**Qual**	**Result**	**Percent[11]**	**Qual**
PM_{10}	µg/m[3]	--	--	150 [7]/50 [8]	--	150 [7]	--	9.2	NA		16.02	NA		10.13	NA		35.42	NA		11.63	NA		10.43	NA	
Aluminum	µg/m[3]	--	--	--	5.1	--	--	0.0644	0.7647		0.3445	2.3690		0.2043	2.2290		1.523	4.6670		0.3077	2.8850		0.1721	1.8120	
Antimony	µg/m[3]	13,000	1.46	--	--	--	--	0.0027	0.0062	*	0.0033	0.0000	*	0.003	0.0000	*	0.0033	0.0004	*	0.003	0.0000	*	0.003	0.0139	*
Arsenic	µg/m[3]	2,500	0.000441	--	0.00045	--	0.19	**0.0082**	0.0973		**0.0099**	0.0680		***0.0027***	0.0288	*	***0.003***	0.0069	*	**0.0043**	0.0402		***0.0033***	0.0213	*
Barium	µg/m[3]	--	--	--	0.52	--	--	0.0024	0.0000	*	0.0045	0.0000	*	0.003	0.0000	*	0.0078	0.0114	*	0.0036	0.0084	*	0.003	0.0059	*
Bismuth	µg/m[3]	--	--	--	--	--	--	NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA	
Bromine	µg/m[3]	--	--	--	--	--	--	0.0009	0.0022	*	0.0021	0.0146		0.0012	0.0128	*	0.0017	0.0052		0.0012	0.0106	*	0.002	0.0213	
Cadmium	µg/m[3]	250	0.00105	--	0.0011	--	--	0.0018	0.0000	*	0.0021	0.0065	*	0.0021	0.0087	*	0.0021	0.0000	*	0.0021	0.0000	*	0.0021	0.0000	*
Calcium	µg/m[3]	--	--	--	--	--	--	0.0583	0.6931		0.3074	2.1140		0.1848	2.0170		1.045	3.2020		0.3033	2.8430		0.2447	2.5760	
Chlorine	µg/m[3]	--	--	--	--	--	--	0.0039	0.0056	*	0.0051	0.0330	*	0.0042	0.0000	*	0.0051	0.0141	*	0.0039	0.0000	*	0.0039	0.0000	*
Chromium	µg/m[3]	100	0.000158	--	0.00016	--	--	0.0006	0.0000	*	***0.0009***	0.0029	*	0.0009	0.0000	*	***0.0009***	0.0020	*	0.0009	0.0000	*	0.0009	0.0000	*
Cobalt	µg/m[3]	10,000	0.000686	--	0.00069	--	--	0.0024	0.0000	*	0.0051	0.0000	*	0.0033	0.0000	*	0.0117	0.0000	*	0.0045	0.0000	*	0.003	0.0000	*
Copper	µg/m[3]	--	--	--	--	--	100	0.035	0.4162		0.1201	0.8256		0.0319	0.3477		0.0676	0.2071		0.0786	0.7367		0.0446	0.4693	
Gallium	µg/m[3]	--	--	--	--	--	--	0.0015	0.0000	*	0.0021	0.0000	*	0.0018	0.0000	*	0.0021	0.0000	*	0.0018	0.0000	*	0.0018	0.0000	*
Germanium	µg/m[3]	--	--	--	--	--	--	0.0012	0.0000	*	0.0015	0.0000	*	0.0015	0.0000	*	0.0015	0.0019	*	0.0012	0.0000	*	0.0012	0.0010	*
Indium	µg/m[3]	--	--	--	--	--	--	0.0018	0.0000	*	0.0021	0.0000	*	0.0021	0.0000	*	0.0024	0.0000	*	0.0021	0.0000	*	0.0021	0.0000	*
Iron	µg/m[3]	--	--	--	--	--	--	0.0742	0.8811		0.335	2.3040		0.1482	1.6160		0.8687	2.6630		0.2581	2.4200		0.1379	1.4510	
Lanthanum	µg/m[3]	--	--	--	--	--	--	0.0021	0.0117	*	0.0048	0.0042	*	0.0033	0.0154	*	0.0084	0.0000	*	0.0039	0.0000	*	0.003	0.0154	*
Lead	µg/m[3]	--	--	1.5 [9 10]	--	1.5 [9 10]	--	0.0153	0.1824		0.0163	0.1120		0.0067	0.0734		0.0082	0.0253		0.0189	0.1770		0.0141	0.1487	
Magnesium	µg/m[3]	--	--	--	--	--	--	0.0318	0.2747	*	0.0636	0.4374		0.0428	0.4664		0.309	0.9470		0.0634	0.5941		0.0357	0.2344	*
Manganese	µg/m[3]	2,500	0.0521	--	0.051	--	--	0.0013	0.0151		0.004	0.0272		0.0023	0.0252		0.0227	0.0697		0.0044	0.0415		0.0022	0.0233	
Mercury	µg/m[3]	1,000	0.313	--	0.31	--	1.8	0.0024	0.0000	*	0.003	0.0000	*	0.0027	0.0010	*	0.003	0.0032	*	0.0027	0.0000	*	0.003	0.0164	*
Molybdenum	µg/m[3]	--	--	--	--	--	--	0.003	0.0207	*	0.0036	0.0155	*	0.0033	0.0000	*	0.0036	0.0000	*	0.0033	0.0040	*	0.0033	0.0000	*
Nickel	µg/m[3]	5,000	0.0079	--	0.008	--	6	0.0024	0.0034	*	0.0033	0.0133	*	0.003	0.0170	*	0.003	0.0001	*	0.0027	0.0049	*	0.0027	0.0114	*
Palladium	µg/m[3]	--	--	--	--	--	--	0.0021	0.0000	*	0.0024	0.0062	*	0.0024	0.0000	*	0.0024	0.0000	*	0.0024	0.0071	*	0.0024	0.0000	*
Phosphorus	µg/m[3]	--	--	--	--	--	--	0.0049	0.0582		0.0036	0.0217	*	0.0027	0.0077	*	0.0067	0.0205		0.003	0.0000	*	0.0027	0.0000	*
Potassium	µg/m[3]	--	--	--	--	--	--	0.057	0.6774		0.164	1.1280		0.0958	1.0450		0.5542	1.6990		0.1346	1.2620		0.0859	0.9045	
Rubidium	µg/m[3]	--	--	--	--	--	--	0.0012	0.0022	*	0.0015	0.0000	*	0.0015	0.0036	*	0.003	0.0092		0.0015	0.0057	*	0.0015	0.0089	*
Selenium	µg/m[3]	500	18.3	--	--	--	--	0.0012	0.0101	*	0.0012	0.0071	*	0.0012	0.0046	*	0.0015	0.0010	*	0.0012	0.0000	*	0.0012	0.0055	*
Silicon	µg/m[3]	--	--	--	--	--	--	0.2029	2.4100		1.066	7.3300		0.5363	5.8500		3.8	11.6500		0.8588	8.0510		0.5038	5.3030	
Silver	µg/m[3]	--	--	--	--	--	--	0.0018	0.0000	*	0.0021	0.0000	*	0.0021	0.0005	*	0.0024	0.0025	*	0.0021	0.0115	*	0.0021	0.0208	*
Sodium	µg/m[3]	--	--	--	--	--	--	0.0936	0.5359	*	0.0411	0.1415	*	0.0345	0.1762	*	0.1554	0.2230	*	0.036	0.1086	*	0.0339	0.1854	*
Strontium	µg/m[3]	--	--	--	--	--	--	0.0015	0.0067	*	0.0027	0.0185		0.0018	0.0118	*	0.0063	0.0192		0.0015	0.0106	*	0.0016	0.0173	
Sulfur	µg/m[3]	--	--	--	--	--	--	0.5217	6.1980		0.7095	4.8790		0.5306	5.7890		0.3935	1.2060		0.5584	5.2350		0.5273	5.5510	
Tin	µg/m[3]	--	--	--	--	--	--	0.0024	0.0000	*	0.003	0.0130	*	0.0027	0.0010	*	0.0033	0.0081	*	0.003	0.0243	*	0.0036	0.0377	
Titanium	µg/m[3]	--	--	--	31	--	--	0.0071	0.0839		0.0353	0.2428		0.0151	0.1644		0.0814	0.2494		0.024	0.2247		0.0128	0.1348	
Vanadium	µg/m[3]	--	--	--	--	--	--	0.0006	0.0000	*	0.0015	0.0000	*	0.0009	0.0000	*	0.003	0.0039	*	0.0012	0.0000	*	0.0009	0.0064	*
Yttrium	µg/m[3]	--	--	--	--	--	--	0.0018	0.0000	*	0.0021	0.0084	*	0.0021	0.0092	*	0.0021	0.0023	*	0.0021	0.0031	*	0.0021	0.0035	*
Zinc	µg/m[3]	--	--	--	--	--	--	0.0106	0.1259		0.0114	0.0787		0.0056	0.0616		0.0102	0.0313		0.0141	0.1324		0.0122	0.1284	
Zirconium	µg/m[3]	--	--	--	--	--	--	0.0021	0.0067	*	0.0027	0.0091	*	0.0024	0.0000	*	0.0029	0.0088		0.0024	0.0071	*	0.0024	0.0000	*

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[10] Only the PM10 fraction is being measured not the total suspended particulates.
[11] Percent of Total Mass
[12] Precipitation measurements are recorded manually by a Hayden-Winkelman High School employee; reliability cannot be verified.
[13] Bold values with bold outline indicate the result exceeds one or more of the comparison criteria.
[14] Bold italicized values indicate the non-detected result exceeds one or more of the comparison criteria.
[15] * = The result is less than three times the level of uncertainty which is shown in place of the result.
[16] -- = Not established
[17] °C = Degrees Celsius
[18] % = Percent
[19] J = Estimated value
[20] mph = miles per hour
[21] NA = Not Applicable or Not Analyzed
[22] NPR = No precipitation recorded.
[23] µg/m[3] = Micrograms per cubic meter
[24] PM_{10} = particulate matter with a diameter less than or equal to 10 microns in size
[25] R = Rejected
[26] This table should be considered preliminary and will be revised based on incoming data, final data validation and QA/QC.

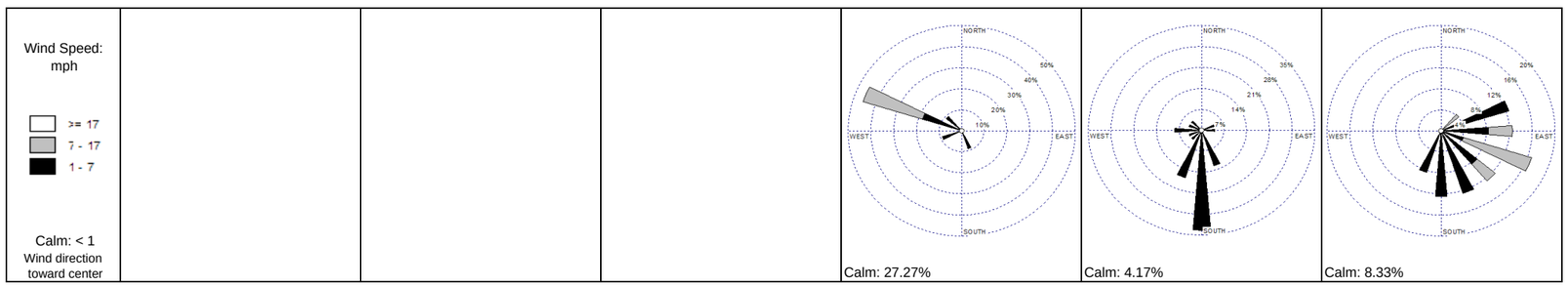

TABLE 2
Air Filter Sampling Laboratory Values for Inorganic Parameters
Winkelman Monitoring Station
Data Evaluation Report
ASARCO LLC Hayden, Arizona Plant Site

Date:								9/30/08			10/6/08			10/13/08			10/16/08			10/19/08			10/22/08		
Avg Wind Speed (mph):								7.21			2.55			2.98			8.20			2.42			10.19		
Avg Wind Direction (degrees):								83			117			283			58			270			48		
Avg Ambient Temperature (°C):								30.2			22.5			14.3			24.8			24.5			21.7		
Avg Ambient Relative Humidity (%):								5.7			9.1			7.7			6.2			6.6			6.7		
Precipitation (inches)[3]:								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[11]**	**Qual**	**Result**	**Percent[11]**	**Qual**	**Result**	**Percent[11]**	**Qual**	**Result**	**Percent[11]**	**Qual**	**Result**	**Percent[11]**	**Qual**	**Result**	**Percent[11]**	**Qual**
PM_{10}	µg/m³	--	--	150 [7]/50 [8]	--	150 [7]	--	19.94	NA		17.35	NA		R	NA		9.58	NA		12.96	NA		17.79	NA	
Aluminum	µg/m³	--	--	--	5.1	--	--	0.1862	1.0220		0.6427	3.9650		R	R		0.2114	2.3710		0.3808	3.1620		0.3842	2.2990	
Antimony	µg/m³	13,000	1.46	--	--	--	--	0.003	0.0000	*	0.0033	0.0000	*	R	R		0.0033	0.0148	*	0.0033	0.0000	*	0.003	0.0006	*
Arsenic	µg/m³	2,500	0.000441	--	0.00045	--	0.19	0.0012	0.0000	*	**0.0137**	0.0848		R	R		0.0033	0.0042	*	***0.0051***	0.0332	*	**0.0056**	0.0333	
Barium	µg/m³	--	--	--	0.52	--	--	0.0033	0.0044	*	0.0048	0.0032	*	R	R		0.0033	0.0042	*	0.0042	0.0027	*	0.0042	0.0048	*
Bismuth	µg/m³	--	--	--	--	--	--	NA	NA		NA	NA		R	R		NA	NA		NA	NA		NA	NA	
Bromine	µg/m³	--	--	--	--	--	--	0.0024	0.0132		0.0016	0.0099		R	R		0.0018	0.0201		0.0016	0.0137		0.0024	0.0147	
Cadmium	µg/m³	250	0.00105	--	0.0011	--	--	0.0021	0.0016	*	0.0021	0.0029	*	R	R		0.0021	0.0095	*	0.0021	0.0070	*	0.0021	0.0003	*
Calcium	µg/m³	--	--	--	--	--	--	0.4447	2.4420		0.5787	3.5700		R	R		0.3143	3.5250		0.3289	2.7310		0.5099	3.0520	
Chlorine	µg/m³	--	--	--	--	--	--	0.0063	0.0000	*	0.011	0.0680		R	R		0.0042	0.0433	*	0.0163	0.1353		0.0166	0.0995	
Chromium	µg/m³	100	0.000158	--	0.00016	--	--	0.0009	0.0000	*	***0.0009***	0.0032	*	R	R		0.0009	0.0000	*	0.0009	0.0000	*	0.0009	0.0000	*
Cobalt	µg/m³	10,000	0.000686	--	0.00069	--	--	0.0033	0.0000	*	0.0057	0.0000	*	R	R		0.0033	0.0000	*	0.0048	0.0000	*	0.0045	0.0000	*
Copper	µg/m³	--	--	--	--	--	100	0.0153	0.0843		0.0463	0.2856		R	R		0.0248	0.2777		0.0736	0.6111		0.0703	0.4210	
Gallium	µg/m³	--	--	--	--	--	--	0.0018	0.0000	*	0.0021	0.0003	*	R	R		0.0018	0.0011	*	0.0021	0.0000	*	0.0018	0.0003	*
Germanium	µg/m³	--	--	--	--	--	--	0.0012	0.0008	*	0.0015	0.0000	*	R	R		0.0015	0.0000	*	0.0015	0.0004	*	0.0012	0.0000	*
Indium	µg/m³	--	--	--	--	--	--	0.0021	0.0000	*	0.0021	0.0000	*	R	R		0.0021	0.0000	*	0.0024	0.0027	*	0.0021	0.0000	*
Iron	µg/m³	--	--	--	--	--	--	0.1581	0.8681		0.3927	2.4230		R	R		0.1579	1.7710		0.2922	2.4260		0.2927	1.7520	
Lanthanum	µg/m³	--	--	--	--	--	--	0.0036	0.0010	*	0.0051	0.0000	*	R	R		0.0033	0.0074	*	0.0048	0.0000	*	0.0048	0.0000	*
Lead	µg/m³	--	--	1.5 [9 10]	--	1.5 [9 10]	--	0.0033	0.0114	*	0.0201	0.1237		R	R		0.0124	0.1394		0.0247	0.2053		0.01	0.0600	
Magnesium	µg/m³	--	--	--	--	--	--	0.0426	0.1895	*	0.1218	0.7515		R	R		0.0378	0.3860	*	0.0679	0.5638		0.0827	0.4948	
Manganese	µg/m³	2,500	0.0521	--	0.051	--	--	0.0033	0.0181		0.0052	0.0322		R	R		0.0024	0.0275		0.004	0.0336		0.0064	0.0380	
Mercury	µg/m³	1,000	0.313	--	0.31	--	1.8	0.0027	0.0052	*	0.003	0.0000	*	R	R		0.003	0.0021	*	0.003	0.0000	*	0.0027	0.0000	*
Molybdenum	µg/m³	--	--	--	--	--	--	0.003	0.0026	*	0.0036	0.0102	*	R	R		0.0033	0.0000	*	0.0036	0.0129	*	0.0033	0.0000	*
Nickel	µg/m³	5,000	0.0079	--	0.008	--	6	0.0027	0.0054	*	0.0033	0.0128	*	R	R		0.003	0.0222	*	0.003	0.0121	*	0.0027	0.0000	*
Palladium	µg/m³	--	--	--	--	--	--	0.0021	0.0034	*	0.0024	0.0000	*	R	R		0.0024	0.0000	*	0.0024	0.0000	*	0.0024	0.0000	*
Phosphorus	µg/m³	--	--	--	--	--	--	0.0039	0.0000	*	0.0033	0.0105	*	R	R		0.0027	0.0063	*	0.003	0.0000	*	0.0027	0.0011	*
Potassium	µg/m³	--	--	--	--	--	--	0.124	0.6808		0.2235	1.3790		R	R		0.0964	1.0810		0.261	2.1680		0.1741	1.0420	
Rubidium	µg/m³	--	--	--	--	--	--	0.0012	0.0041	*	0.0015	0.0055	*	R	R		0.0015	0.0069	*	0.0015	0.0078	*	0.0015	0.0042	*
Selenium	µg/m³	500	18.3	--	--	--	--	0.0012	0.0039	*	0.0015	0.0058	*	R	R		0.0012	0.0000	*	0.0012	0.0039	*	0.0012	0.0017	*
Silicon	µg/m³	--	--	--	--	--	--	0.6121	3.3620		1.7	10.4900		R	R		0.5989	6.7170		1.099	9.1260		1.093	6.5430	
Silver	µg/m³	--	--	--	--	--	--	0.0021	0.0018	*	0.0024	0.0003	*	R	R		0.0021	0.0127	*	0.0021	0.0000	*	0.0021	0.0006	*
Sodium	µg/m³	--	--	--	--	--	--	0.042	0.0864	*	0.1314	0.7044	*	R	R		0.0351	0.1991	*	0.1104	0.3108	*	0.0372	0.0727	*
Strontium	µg/m³	--	--	--	--	--	--	0.0025	0.0137		0.0038	0.0235		R	R		0.0031	0.0343		0.0018	0.0082	*	0.0028	0.0169	
Sulfur	µg/m³	--	--	--	--	--	--	1.755	9.6370		0.4013	2.4760		R	R		0.4282	4.8020		0.4116	3.4180		0.276	1.6520	
Tin	µg/m³	--	--	--	--	--	--	0.003	0.0163		0.003	0.0171	*	R	R		0.0027	0.0069	*	0.003	0.0133	*	0.003	0.0110	*
Titanium	µg/m³	--	--	--	31	--	--	0.0175	0.0959		0.037	0.2280		R	R		0.0143	0.1605		0.0298	0.2475		0.0345	0.2063	
Vanadium	µg/m³	--	--	--	--	--	--	0.0009	0.0000	*	0.0015	0.0000	*	R	R		0.0009	0.0000	*	0.0015	0.0000	*	0.0015	0.0000	*
Yttrium	µg/m³	--	--	--	--	--	--	0.0018	0.0072	*	0.0021	0.0000	*	R	R		0.0021	0.0042	*	0.0024	0.0000	*	0.0021	0.0000	*
Zinc	µg/m³	--	--	--	--	--	--	0.0045	0.0246		0.0277	0.1711		R	R		0.0097	0.1082		0.0107	0.0891		0.0101	0.0606	
Zirconium	µg/m³	--	--	--	--	--	--	0.0024	0.0052	*	0.0027	0.0102	*	R	R		0.0024	0.0026	*	0.0027	0.0145	*	0.0024	0.0025	*

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] Percent of Total Mass
[12] Precipitation measurements are recorded manually by a Hayden-Winkelman High School employee; reliability cannot be verified.
[13] Bold values with bold outline indicate the result exceeds one or more of the comparison criteria.
[14] Bold italicized values indicate the non-detected result exceeds one or more of the comparison criteria.
[15] * = The result is less than three times the level of uncertainty which is shown in place of the result.
[16] -- = Not established
[17] °C = Degrees Celsius
[18] % = Percent
[19] J = Estimated value
[20] mph = miles per hour
[21] NA = Not Applicable or Not Analyzed
[22] NPR = No precipitation recorded.
[23] µg/m³ = Micrograms per cubic meter
[24] PM_{10} = particulate matter with a diameter less than or equal to 10 microns in size
[25] R = Rejected
[26] This table should be considered preliminary and will be revised based on incoming data, final data validation and QA/QC.

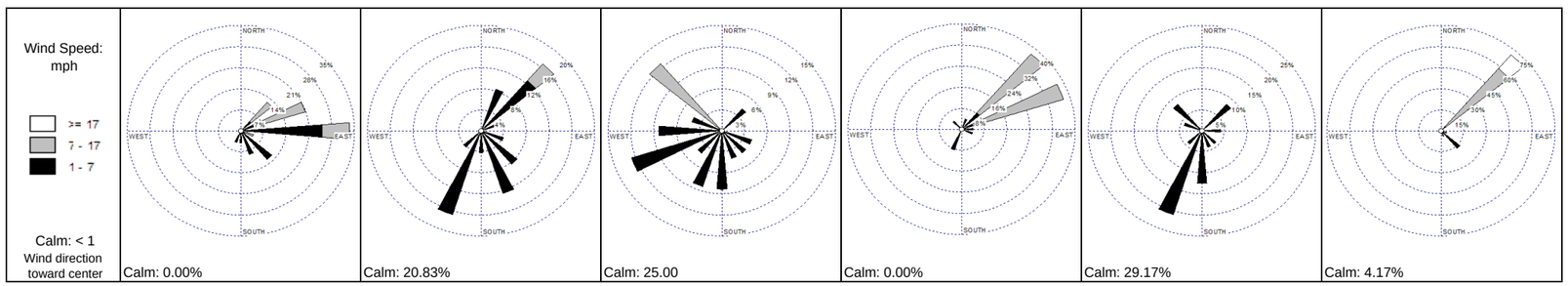

TABLE 2
Air Filter Sampling Laboratory Values for Inorganic Parameters
Winkelman Monitoring Station
Data Evaluation Report
ASARCO LLC Hayden, Arizona Plant Site

Date:								10/25/08			10/28/08			10/31/08			11/3/08			11/6/08			11/9/08		
Avg Wind Speed (mph):								3.04			11.06			2.49			2.67			5.41			5.10		
Avg Wind Direction (degrees):								315			57			31			234			8			235		
Avg Ambient Temperature (°C):								20.1			24.9			23.4			22.6			15.6			13.5		
Avg Ambient Relative Humidity (%):								6.7			6.1			6.3			7.4			7.4			14.2		
Precipitation (inches)[3]:								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[11]**	**Qual**	**Result**	**Percent[11]**	**Qual**	**Result**	**Percent[11]**	**Qual**	**Result**	**Percent[11]**	**Qual**	**Result**	**Percent[11]**	**Qual**	**Result**	**Percent[11]**	**Qual**
PM_{10}	µg/m[3]	--	--	150 [7]/50 [8]	--	150 [7]	--	17.34	NA		19.02	NA		20.63	NA		R	NA		10.4	NA		**77.09**	NA	
Aluminum	µg/m[3]	--	--	--	5.1	--	--	0.4755	2.9040		0.4699	2.6470		0.581	2.9990		R	R		0.3301	3.3010		3.379	4.5820	
Antimony	µg/m[3]	13,000	1.46	--	--	--	--	0.003	0.0023	*	0.003	0.0008	*	0.0033	0.0017	*	R	R		0.003	0.0000	*	0.0056	0.0077	
Arsenic	µg/m[3]	2,500	0.000441	--	0.00045	--	0.19	**0.0098**	0.0601		***0.0024***	0.0053	*	**0.0179**	0.0926		R	R		**0.0073**	0.0730		**0.0272**	0.0368	
Barium	µg/m[3]	--	--	--	0.52	--	--	0.0045	0.0078	*	0.0042	0.0069	*	0.0054	0.0277		R	R		0.0036	0.0000	*	0.0309	0.0419	
Bismuth	µg/m[3]	--	--	--	--	--	--	NA	NA		NA	NA		0.0302	0.1558		NA	NA		NA	NA		0.0297	0.0402	
Bromine	µg/m[3]	--	--	--	--	--	--	0.0012	0.0060	*	0.0028	0.0157		0.0023	0.0117		R	R		0.0012	0.0094	*	0.0021	0.0029	
Cadmium	µg/m[3]	250	0.00105	--	0.0011	--	--	0.0021	0.0006	*	0.0021	0.0000	*	***0.0021***	0.0097	*	R	R		0.0021	0.0014	*	***0.0024***	0.0018	*
Calcium	µg/m[3]	--	--	--	--	--	--	0.4038	2.4660		0.7872	4.4350		0.5706	2.9450		R	R		0.3277	3.2770		2.114	2.8660	
Chlorine	µg/m[3]	--	--	--	--	--	--	0.0048	0.0227	*	0.0058	0.0329		0.0057	0.0044	*	R	R		0.0107	0.1074		0.1828	0.2479	
Chromium	µg/m[3]	100	0.000158	--	0.00016	--	--	0.0009	0.0000	*	***0.0009***	0.0029	*	***0.0009***	0.0036	*	R	R		0.0009	0.0009	*	**0.0042**	0.0057	
Cobalt	µg/m[3]	10,000	0.000686	--	0.00069	--	--	0.0054	0.0000	*	0.0048	0.0000	*	0.0069	0.0000	*	R	R		0.0045	0.0000	*	0.0279	0.0000	*
Copper	µg/m[3]	--	--	--	--	--	100	0.1315	0.8031		0.0326	0.1838		0.3796	1.9590		R	R		0.0891	0.8913		1.39	1.8850	
Gallium	µg/m[3]	--	--	--	--	--	--	0.0018	0.0000	*	0.0018	0.0000	*	0.0024	0.0000	*	R	R		0.0018	0.0000	*	0.0024	0.0000	*
Germanium	µg/m[3]	--	--	--	--	--	--	0.0012	0.0000	*	0.0012	0.0000	*	0.0015	0.0000	*	R	R		0.0012	0.0000	*	0.0015	0.0000	*
Indium	µg/m[3]	--	--	--	--	--	--	0.0021	0.0003	*	0.0021	0.0000	*	0.0021	0.0000	*	R	R		0.0021	0.0000	*	0.0024	0.0000	*
Iron	µg/m[3]	--	--	--	--	--	--	0.3552	2.1690		0.349	1.9660		0.5452	2.8140		R	R		0.2528	2.5280		2.776	3.7640	
Lanthanum	µg/m[3]	--	--	--	--	--	--	0.0048	0.0017	*	0.0048	0.0000	*	0.0051	0.0000	*	R	R		0.0039	0.0000	*	0.0228	0.0000	*
Lead	µg/m[3]	--	--	1.5 [9 10]	--	1.5 [9 10]	--	0.0382	0.2335		0.0041	0.0231		0.0848	0.4377		R	R		0.0144	0.1441		0.0824	0.1117	
Magnesium	µg/m[3]	--	--	--	--	--	--	0.0764	0.4664		0.0677	0.3814		0.0846	0.4364		R	R		0.0588	0.5876		0.5306	0.7195	
Manganese	µg/m[3]	2,500	0.0521	--	0.051	--	--	0.0058	0.0354		0.0097	0.0546		0.009	0.0467		R	R		0.0048	0.0485		**0.0524**	0.0710	
Mercury	µg/m[3]	1,000	0.313	--	0.31	--	1.8	0.0027	0.0000	*	0.0024	0.0000	*	0.003	0.0000	*	R	R		0.0027	0.0052	*	0.003	0.0000	*
Molybdenum	µg/m[3]	--	--	--	--	--	--	0.0033	0.0193	*	0.003	0.0000	*	0.0051	0.0265		R	R		0.0033	0.0000	*	0.0102	0.0139	
Nickel	µg/m[3]	5,000	0.0079	--	0.008	--	6	0.0027	0.0017	*	0.0027	0.0056	*	0.003	0.0066	*	R	R		0.003	0.0198	*	0.0039	0.0039	*
Palladium	µg/m[3]	--	--	--	--	--	--	0.0021	0.0000	*	0.0021	0.0000	*	0.0024	0.0000	*	R	R		0.0024	0.0066	*	0.0024	0.0000	*
Phosphorus	µg/m[3]	--	--	--	--	--	--	0.0033	0.0049	*	0.0039	0.0157	*	0.0039	0.0000	*	R	R		0.0027	0.0000	*	0.0132	0.0170	*
Potassium	µg/m[3]	--	--	--	--	--	--	0.2156	1.3170		0.2181	1.2290		0.2561	1.3220		R	R		0.1278	1.2780		1.386	1.8790	
Rubidium	µg/m[3]	--	--	--	--	--	--	0.0015	0.0035	*	0.0012	0.0034	*	0.0018	0.0092		R	R		0.0012	0.0038	*	0.009	0.0123	
Selenium	µg/m[3]	500	18.3	--	--	--	--	0.0012	0.0081	*	0.0012	0.0005	*	0.0015	0.0073	*	R	R		0.0013	0.0127		0.0069	0.0094	
Silicon	µg/m[3]	--	--	--	--	--	--	1.298	7.9240		1.324	7.4560		1.495	7.7180		R	R		0.8974	8.9740		8.376	11.3600	
Silver	µg/m[3]	--	--	--	--	--	--	0.0021	0.0000	*	0.0021	0.0011	*	0.0021	0.0063	*	R	R		0.0021	0.0061	*	0.003	0.0041	
Sodium	µg/m[3]	--	--	--	--	--	--	0.0399	0.1029	*	0.0429	0.0857	*	0.0459	0.0000	*	R	R		0.0978	0.4619	*	0.2139	0.1624	*
Strontium	µg/m[3]	--	--	--	--	--	--	0.003	0.0184		0.0037	0.0210		0.0032	0.0165		R	R		0.003	0.0297		0.0164	0.0223	
Sulfur	µg/m[3]	--	--	--	--	--	--	0.7067	4.3160		0.9224	5.1960		1.09	5.6280		R	R		0.2746	2.7460		0.7863	1.0660	
Tin	µg/m[3]	--	--	--	--	--	--	0.003	0.0078	*	0.0027	0.0058	*	0.003	0.0085	*	R	R		0.003	0.0212	*	0.0033	0.0046	*
Titanium	µg/m[3]	--	--	--	31	--	--	0.0338	0.2064		0.032	0.1804		0.0387	0.1995		R	R		0.0244	0.2439		0.2423	0.3286	
Vanadium	µg/m[3]	--	--	--	--	--	--	0.0015	0.0000	*	0.0015	0.0005	*	0.0015	0.0034	*	R	R		0.0012	0.0000	*	0.0087	0.0107	*
Yttrium	µg/m[3]	--	--	--	--	--	--	0.0021	0.0083	*	0.0018	0.0053	*	0.0021	0.0007	*	R	R		0.0021	0.0047	*	0.0024	0.0016	*
Zinc	µg/m[3]	--	--	--	--	--	--	0.0223	0.1363		0.0072	0.0406		0.0719	0.3711		R	R		0.0132	0.1323		0.0561	0.0761	
Zirconium	µg/m[3]	--	--	--	--	--	--	0.0024	0.0124	*	0.003	0.0170		0.003	0.0156		R	R		0.0024	0.0226	*	0.0081	0.0110	

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] Percent of Total Mass
[12] Precipitation measurements are recorded manually by a Hayden-Winkelman High School employee; reliability cannot be verified.
[13] Bold values with bold outline indicate the result exceeds one or more of the comparison criteria.
[14] Bold italicized values indicate the non-detected result exceeds one or more of the comparison criteria.
[15] * = The result is less than three times the level of uncertainty which is shown in place of the result.
[16] -- = Not established
[17] °C = Degrees Celsius
[18] % = Percent
[19] J = Estimated value
[20] mph = miles per hour
[21] NA = Not Applicable or Not Analyzed
[22] NPR = No precipitation recorded.
[23] µg/m[3] = Micrograms per cubic meter
[24] PM_{10} = particulate matter with a diameter less than or equal to 10 microns in size
[25] R = Rejected
[26] This table should be considered preliminary and will be revised based on incoming data, final data validation and QA/QC.

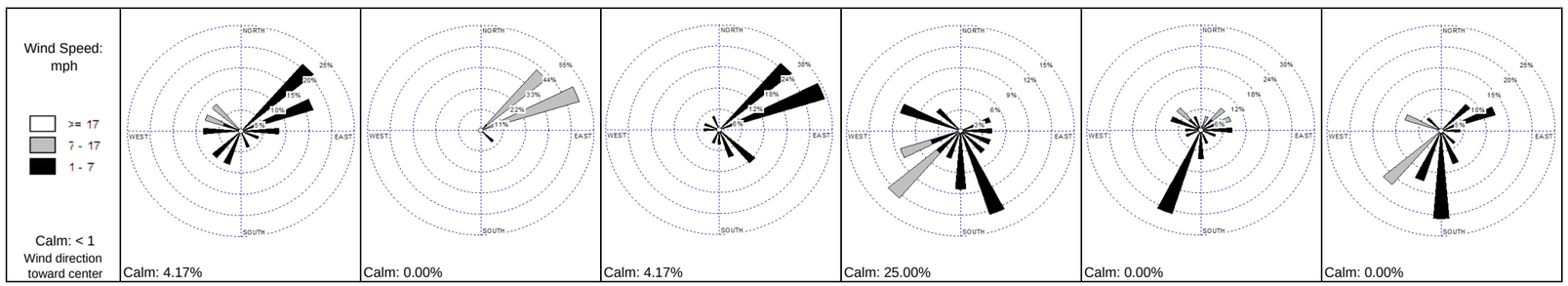

TABLE 2
Air Filter Sampling Laboratory Values for Inorganic Parameters
Winkelman Monitoring Station
Data Evaluation Report
ASARCO LLC Hayden, Arizona Plant Site

Date:								11/12/08			11/15/08			11/18/08			11/21/08			11/24/08			11/27/08		
Avg Wind Speed (mph):								2.92			11.43			8.76			16.90			7.39			3.23		
Avg Wind Direction (degrees):								293			93			102			79			67			52		
Avg Ambient Temperature (°C):								14.4			20.1			20.0			16.9			17.3			13.7		
Avg Ambient Relative Humidity (%):								11.6			6.8			6.9			7.3			7.3			40.3		
Precipitation (inches)[3]:								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[11]**	**Qual**	**Result**	**Percent[11]**	**Qual**	**Result**	**Percent[11]**	**Qual**	**Result**	**Percent[11]**	**Qual**	**Result**	**Percent[11]**	**Qual**	**Result**	**Percent[11]**	**Qual**
PM_{10}	µg/m[3]	--	--	150 [7]/50 [8]	--	150 [7]	--	16.87	NA		R	NA		13.77	NA		43.55	NA		16.64	NA		7.43	NA	
Aluminum	µg/m[3]	--	--	--	5.1	--	--	0.4765	2.9320		R	R		0.45	3.4390		1.413	3.3880		0.5829	3.6620		0.1126	1.5710	
Antimony	µg/m[3]	13,000	1.46	--	--	--	--	0.003	0.0003	*	R	R		0.003	0.0000	*	0.0105	0.0253		0.0069	0.0284	*	0.0063	0.0624	*
Arsenic	µg/m[3]	2,500	0.000441	--	0.00045	--	0.19	**0.0123**	0.0756		R	R		***0.0012***	0.0050	*	***0.0018***	0.0034	*	**0.0035**	0.0222		**0.0079**	0.1097	
Barium	µg/m[3]	--	--	--	0.52	--	--	0.0045	0.0133	*	R	R		0.0039	0.0000	*	0.0111	0.0227	*	0.0057	0.0180	*	0.0039	0.0158	*
Bismuth	µg/m[3]	--	--	--	--	--	--	NA	NA		NA	NA		NA	NA		NA	NA		NA	NA		NA	NA	
Bromine	µg/m[3]	--	--	--	0.0127	--	--	0.0021	0.0127		R	R		0.0012	0.0086	*	0.0024	0.0059		0.0026	0.0163		0.0006	0.0072	*
Cadmium	µg/m[3]	250	0.00105	--	0.0011	--	--	***0.0021***	0.0122	*	R	R		0.0021	0.0000	*	0.0024	0.0000	*	0.0024	0.0000	*	0.0024	0.0000	*
Calcium	µg/m[3]	--	--	--	--	--	--	0.4265	2.6250		R	R		0.6705	5.1250		2.456	5.8890		0.7952	4.9960		0.1595	2.2260	
Chlorine	µg/m[3]	--	--	--	--	--	--	0.0049	0.0301		R	R		0.0145	0.1112		0.0197	0.0473		0.0075	0.0473		0.0177	0.2464	
Chromium	µg/m[3]	100	0.000158	--	0.00016	--	--	***0.0009***	0.0029	*	R	R		***0.0009***	0.0014	*	***0.0015***	0.0014	*	0.0012	0.0000	*	0.0009	0.0000	*
Cobalt	µg/m[3]	10,000	0.000686	--	0.00069	--	--	0.006	0.0038	*	R	R		0.0048	0.0000	*	***0.0123***	0.0046	*	***0.0054***	0.0089	*	0.0036	0.0000	*
Copper	µg/m[3]	--	--	--	--	--	100	0.2268	1.3950		R	R		0.0155	0.1184		0.0644	0.1543		0.0361	0.2266		0.0756	1.0550	
Gallium	µg/m[3]	--	--	--	--	--	--	0.0021	0.0000	*	R	R		0.0018	0.0004	*	0.0012	0.0000	*	0.0012	0.0000	*	0.0012	0.0000	*
Germanium	µg/m[3]	--	--	--	--	--	--	0.0015	0.0000	*	R	R		0.0012	0.0018	*	0.0012	0.0009	*	0.0012	0.0000	*	0.0009	0.0000	*
Indium	µg/m[3]	--	--	--	--	--	--	0.0021	0.0000	*	R	R		0.0021	0.0000	*	0.0027	0.0000	*	0.0027	0.0000	*	0.0024	0.0000	*
Iron	µg/m[3]	--	--	--	--	--	--	0.4047	2.4910		R	R		0.2609	1.9940		0.9148	2.1930		0.3614	2.2710		0.2004	2.7970	
Lanthanum	µg/m[3]	--	--	--	--	--	--	0.0048	0.0000	*	R	R		0.0042	0.0000	*	0.0111	0.0000	*	0.006	0.0000	*	0.0042	0.0000	*
Lead	µg/m[3]	--	--	1.5 [9 10]	--	1.5 [9 10]	--	0.0263	0.1617		R	R		0.0033	0.0000	*	0.003	0.0072		0.0066	0.0417		0.0314	0.4382	
Magnesium	µg/m[3]	--	--	--	--	--	--	0.0735	0.4523		R	R		0.0558	0.4268		0.0864	0.1426	*	0.0318	0.1384	*	0.0204	0.0000	*
Manganese	µg/m[3]	2,500	0.0521	--	0.051	--	--	0.0077	0.0472		R	R		0.0051	0.0389		0.0171	0.0411		0.0057	0.0361		0.0012	0.0112	*
Mercury	µg/m[3]	1,000	0.313	--	0.31	--	1.8	0.003	0.0000	*	R	R		0.0027	0.0000	*	0.0021	0.0009	*	0.0021	0.0000	*	0.0021	0.0000	*
Molybdenum	µg/m[3]	--	--	--	--	--	--	0.0036	0.0151	*	R	R		0.003	0.0000	*	0.0024	0.0021	*	0.0024	0.0000	*	0.0034	0.0473	
Nickel	µg/m[3]	5,000	0.0079	--	0.008	--	6	0.003	0.0084	*	R	R		0.0027	0.0086	*	0.0021	0.0023	*	0.0021	0.0000	*	0.0018	0.0000	*
Palladium	µg/m[3]	--	--	--	--	--	--	0.0024	0.0012	*	R	R		0.0021	0.0000	*	0.0024	0.0000	*	0.0024	0.0000	*	0.0021	0.0000	*
Phosphorus	µg/m[3]	--	--	--	--	--	--	0.003	0.0075	*	R	R		0.003	0.0202	*	0.0072	0.0000	*	0.0048	0.0000	*	0.0036	0.0000	*
Potassium	µg/m[3]	--	--	--	--	--	--	0.1998	1.2290		R	R		0.1981	1.5140		0.6601	1.5830		0.2486	1.5620		0.0903	1.2600	
Rubidium	µg/m[3]	--	--	--	--	--	--	0.0017	0.0104		R	R		0.0015	0.0101	*	0.003	0.0072		0.0011	0.0068		0.0009	0.0033	*
Selenium	µg/m[3]	500	18.3	--	--	--	--	0.0012	0.0072	*	R	R		0.0012	0.0007	*	0.0009	0.0016	*	0.0009	0.0047	*	0.0057	0.0802	
Silicon	µg/m[3]	--	--	--	--	--	--	1.264	7.7800		R	R		1.21	9.2490		3.879	9.3000		1.493	9.3830		0.309	4.3120	
Silver	µg/m[3]	--	--	--	--	--	--	0.0021	0.0023	*	R	R		0.0021	0.0061	*	0.0024	0.0000	*	0.0024	0.0000	*	0.0021	0.0000	*
Sodium	µg/m[3]	--	--	--	--	--	--	0.1185	0.3448	*	R	R		0.0351	0.0396	*	0.0717	0.0000	*	0.0483	0.0985	*	0.0888	0.6465	*
Strontium	µg/m[3]	--	--	--	--	--	--	0.0041	0.0255		R	R		0.0044	0.0338		0.0113	0.0271		0.0029	0.0180		0.0009	0.0099	*
Sulfur	µg/m[3]	--	--	--	--	--	--	0.4262	2.6230		R	R		0.1377	1.0530		0.63	1.5100		0.4367	2.7440		0.293	4.0890	
Tin	µg/m[3]	--	--	--	--	--	--	0.003	0.0113	*	R	R		0.003	0.0122	*	0.0036	0.0028	*	0.0033	0.0089	*	0.0033	0.0118	*
Titanium	µg/m[3]	--	--	--	31	--	--	0.034	0.2095		R	R		0.0266	0.2037		0.0969	0.2324		0.0321	0.2014		0.0143	0.1997	
Vanadium	µg/m[3]	--	--	--	--	--	--	0.0015	0.0000	*	R	R		0.0012	0.0000	*	0.0033	0.0009	*	0.0015	0.0012	*	0.0009	0.0000	*
Yttrium	µg/m[3]	--	--	--	--	--	--	0.0021	0.0046	*	R	R		0.0018	0.0000	*	0.0012	0.0025	*	0.0012	0.0024	*	0.0012	0.0000	*
Zinc	µg/m[3]	--	--	--	--	--	--	0.0219	0.1350		R	R		0.0028	0.0216		0.0109	0.0262		0.0088	0.0550		0.0225	0.3134	
Zirconium	µg/m[3]	--	--	--	--	--	--	0.0024	0.0078	*	R	R		0.0024	0.0086	*	0.0045	0.0107		0.0015	0.0083	*	0.0015	0.0131	*

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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[11] Percent of Total Mass
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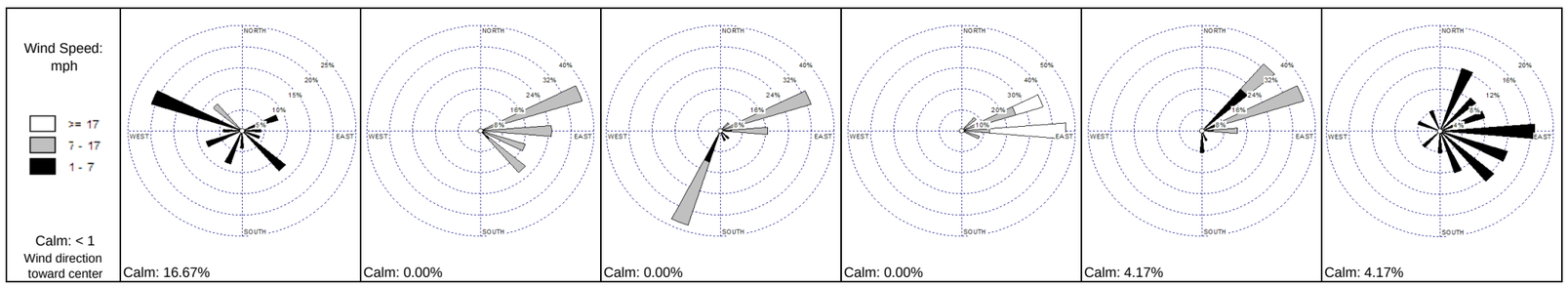

TABLE 2
Air Filter Sampling Laboratory Values for Inorganic Parameters
Winkelman Monitoring Station
Data Evaluation Report
ASARCO LLC Hayden, Arizona Plant Site

Date:								11/30/08			12/3/08			12/6/08			12/9/08		
Avg Wind Speed (mph):								3.60			1.80			2.24			5.90		
Avg Wind Direction (degrees):								306			204			326			8		
Avg Ambient Temperature (°C):								13.4			13.9			12.0			13.0		
Avg Ambient Relative Humidity (%):								31.7			19.4			16.2			14.2		
Precipitation (inches)[3]:								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[11]**	**Qual**	**Result**	**Percent[11]**	**Qual**	**Result**	**Percent[11]**	**Qual**	**Result**	**Percent[11]**	**Qual**
PM_{10}	µg/m^3	--	--	150 [7]/50 [8]	--	150 [7]	--	12.91	NA		12.2	NA		9.43	NA		12.7	NA	
Aluminum	µg/m^3	--	--	--	5.1	--	--	0.1681	1.3450		0.2686	2.2780		0.16	1.7380		0.3364	2.7370	
Antimony	µg/m^3	13,000	1.46	--	--	--	--	0.01	0.0799		0.0066	0.0467	*	0.0083	0.0905		0.0078	0.0636	
Arsenic	µg/m^3	2,500	0.000441	--	0.00045	--	0.19	**0.0339**	0.2712		**0.0082**	0.0699		**0.0104**	0.1130		**0.01**	0.0812	
Barium	µg/m^3	--	--	--	0.52	--	--	0.0048	0.0094	*	0.0048	0.0367	*	0.0042	0.0082	*	0.0051	0.0215	*
Bismuth	µg/m^3	--	--	--	--	--	--	0.0281	0.2245		0.0134	0.1134		NA	NA		NA	NA	
Bromine	µg/m^3	--	--	--	--	--	--	0.0017	0.0139		0.0009	0.0060	*	0.0009	0.0092	*	0.0012	0.0096	
Cadmium	µg/m^3	250	0.00105	--	0.0011	--	--	***0.0027***	0.0121	*	0.0024	0.0080	*	0.0024	0.0031	*	0.0024	0.0000	*
Calcium	µg/m^3	--	--	--	--	--	--	0.1773	1.4180		0.5217	4.4240		0.2266	2.4600		0.3789	3.0820	
Chlorine	µg/m^3	--	--	--	--	--	--	0.0075	0.0000	*	0.0548	0.4648		0.0066	0.0424	*	0.0311	0.2532	
Chromium	µg/m^3	100	0.000158	--	0.00016	--	--	0.0012	0.0000	*	***0.0009***	0.0028	*	0.0012	0.0000	*	**0.0015**	0.0123	
Cobalt	µg/m^3	10,000	0.000686	--	0.00069	--	--	***0.0048***	0.0128	*	0.0042	0.0000	*	***0.0036***	0.0087	*	***0.006***	0.0054	*
Copper	µg/m^3	--	--	--	--	--	100	0.2678	2.1420		0.1416	1.2010		0.142	1.5430		0.176	1.4310	
Gallium	µg/m^3	--	--	--	--	--	--	0.0015	0.0000	*	0.0012	0.0000	*	0.0015	0.0000	*	0.0015	0.0000	*
Germanium	µg/m^3	--	--	--	--	--	--	0.0012	0.0000	*	0.0012	0.0000	*	0.0012	0.0000	*	0.0012	0.0000	*
Indium	µg/m^3	--	--	--	--	--	--	0.0027	0.0000	*	0.0027	0.0000	*	0.0027	0.0000	*	0.0027	0.0000	*
Iron	µg/m^3	--	--	--	--	--	--	0.2719	2.1750		0.2633	2.2330		0.177	1.9230		0.3858	3.1390	
Lanthanum	µg/m^3	--	--	--	--	--	--	0.0048	0.0000	*	0.0048	0.0000	*	0.0042	0.0000	*	0.0054	0.0000	*
Lead	µg/m^3	--	--	1.5 [9 10]	--	1.5 [9 10]	--	0.0647	0.5179		0.0377	0.3198		0.0266	0.2894		0.0285	0.2317	
Magnesium	µg/m^3	--	--	--	--	--	--	0.0258	0.0000	*	0.048	0.3186	*	0.0234	0.0000	*	0.0285	0.1666	*
Manganese	µg/m^3	2,500	0.0521	--	0.051	--	--	0.0019	0.0154		0.0029	0.0244		0.0024	0.0256		0.0035	0.0283	
Mercury	µg/m^3	1,000	0.313	--	0.31	--	1.8	0.0021	0.0000	*	0.0021	0.0000	*	0.0021	0.0000	*	0.0021	0.0000	*
Molybdenum	µg/m^3	--	--	--	--	--	--	0.0029	0.0234		0.0024	0.0204		0.0024	0.0189	*	0.0039	0.0314	
Nickel	µg/m^3	5,000	0.0079	--	0.008	--	6	0.0021	0.0000	*	0.0021	0.0000	*	0.0021	0.0000	*	0.0021	0.0011	*
Palladium	µg/m^3	--	--	--	--	--	--	0.0021	0.0019	*	0.0021	0.0000	*	0.0021	0.0000	*	0.0021	0.0000	*
Phosphorus	µg/m^3	--	--	--	--	--	--	0.0045	0.0000	*	0.0042	0.0000	*	0.0039	0.0000	*	0.0042	0.0000	*
Potassium	µg/m^3	--	--	--	--	--	--	0.1324	1.0590		0.1765	1.4970		0.0927	1.0070		0.1749	1.4230	
Rubidium	µg/m^3	--	--	--	--	--	--	0.0014	0.0109		0.0009	0.0064	*	0.0009	0.0000	*	0.0009	0.0011	*
Selenium	µg/m^3	500	18.3	--	--	--	--	0.0107	0.0855		0.0024	0.0208		0.0019	0.0210		0.0084	0.0682	
Silicon	µg/m^3	--	--	--	--	--	--	0.5132	4.1060		0.8409	7.1310		0.492	5.3430		0.9963	8.1050	
Silver	µg/m^3	--	--	--	--	--	--	0.0024	0.0004	*	0.0024	0.0068	*	0.0024	0.0000	*	0.0024	0.0000	*
Sodium	µg/m^3	--	--	--	--	--	--	0.0489	0.0000	*	0.1314	1.1140		0.0972	0.4244	*	0.108	0.5516	*
Strontium	µg/m^3	--	--	--	--	--	--	0.0009	0.0053	*	0.0043	0.0367		0.0022	0.0240		0.0028	0.0230	
Sulfur	µg/m^3	--	--	--	--	--	--	0.7646	6.1170		0.3659	3.1030		0.4382	4.7580		0.2926	2.3800	
Tin	µg/m^3	--	--	--	--	--	--	0.0033	0.0023	*	0.0033	0.0168	*	0.0033	0.0179	*	0.0033	0.0073	*
Titanium	µg/m^3	--	--	--	31	--	--	0.0167	0.1333		0.019	0.1609		0.0129	0.1401		0.0277	0.2256	
Vanadium	µg/m^3	--	--	--	--	--	--	0.0012	0.0000	*	0.0012	0.0000	*	0.0009	0.0000	*	0.0015	0.0034	*
Yttrium	µg/m^3	--	--	--	--	--	--	0.0012	0.0000	*	0.0012	0.0000	*	0.0012	0.0000	*	0.0012	0.0000	*
Zinc	µg/m^3	--	--	--	--	--	--	0.036	0.2878		0.0226	0.1913		0.0156	0.1692		0.0186	0.1517	
Zirconium	µg/m^3	--	--	--	--	--	--	0.0015	0.0038	*	0.0015	0.0028	*	0.0015	0.0000	*	0.0015	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] Percent of Total Mass
[12] Precipitation measurements are recorded manually by a Hayden-Winkelman High School employee; reliability cannot be verified.
[13] Bold values with bold outline indicate the result exceeds one or more of the comparison criteria.
[14] Bold italicized values indicate the non-detected result exceeds one or more of the comparison criteria.
[15] * = The result is less than three times the level of uncertainty which is shown in place of the result.
[16] -- = Not established
[17] °C = Degrees Celsius
[18] % = Percent
[19] J = Estimated value
[20] mph = miles per hour
[21] NA = Not Applicable or Not Analyzed
[22] NPR = No precipitation recorded.
[23] µg/m^3 = Micrograms per cubic meter
[24] PM_{10} = particulate matter with a diameter less than or equal to 10 microns in size
[25] R = Rejected
[26] This table should be considered preliminary and will be revised based on incoming data, final data validation and QA/QC.

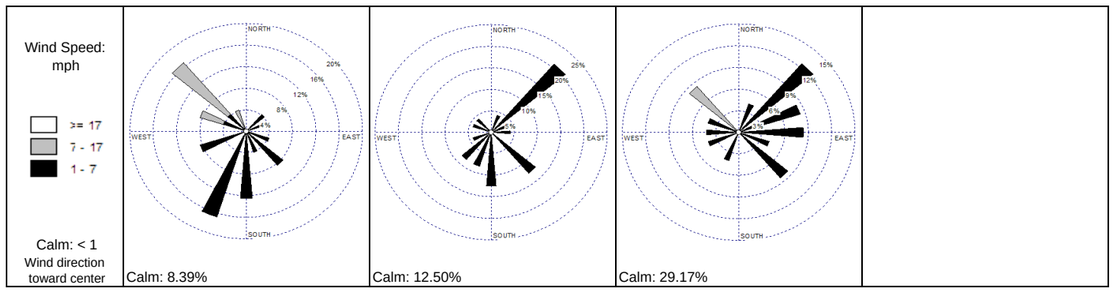

TABLE 3
Comparison of Ambient Air Concentrations at Organ Pipe, Hayden, and Winkelman Monitoring Stations
Data Evaluation Report
ASARCO LLC Hayden, Arizona Plant Site

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 Winkelman[5] (µg/m^3)	Ratio of Concentration at Hayden to Organ Pipe National Monument	Ratio of Concentration at Winkelman to Organ Pipe National Monument	Ratio of Concentration at Hayden to Winkelman	Ratio of Concentration at Hayden to EPA Preliminary Remediation Goal	Ratio of Concentration at Winkelman to EPA Preliminary Remediation Goal
PM_{10}	--	16	NA	34.7	17.9	2.17	1.12	1.94	--	--
Arsenic	0.00045	ND (0.0003-0.0006)	**0.0331**	**0.0209**	**0.00780**	34.8-69.7 [6]	13.0-26.0 [6]	2.68	46.4	17.3
Cadmium	0.0011	ND (0.0006)	**0.0168**	**0.0022**	ND (0.0018-0.0027)	3.67 [6]	3.00-4.50 [6]	0.814-1.22 [6]	2.00	1.64-2.45 [6]
Chromium	0.00016	**0.000493**	**0.00641**	**0.0013**	**0.000664**	2.64	1.35	1.96	8.13	4.15
Copper	--	0.00142	0.865	0.0501	0.222	35.3	156	0.226	--	--
Lead	--	0.00133	0.0686	0.101	0.0282	75.9	21.2	3.58	--	--

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 November 13, 2007 and November 30, 2008.

[6] The date range of the Winkelman data is between January 12, 2008 and December 9, 2008.

[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

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Appendix D
Control Measures and Technologies Implemented at the ASARCO Ray Complex and Hayden Smelter and Concentrator

Table 1
Process and Control Equipment Description

Equipment	Quantity	Manufacturer	Model/Type	Serial No.	Date Installed or modified	Size	Rated Capacity	New or Existing
Sampling and Unloading Operations:								
Dump hopper	1	Linkbelt	stainless steel lining	n/a	1983	12'x28.6'	175 tons per hour (tph), 1,533,000 tons per year (tpy)	Existing
Unloading conveyors	3	Linkbelt	n/a			60"x17'8"	175 tph, 1,533,000 tpy	Existing
			51M	n/a	1964/1968	cars: 30"x20'		Existing
Bedding area - 4 storage bins	4	Concrete	n/a	n/a	1964/1968	220'x40'x20'	30,000 wet tons, 26,000 dry tons	Existing
Bedding area - Vibrating screen/ grizzly	1	Ty-rock	I-surface/F300	7308	1967	4' x 8'	n/a	Existing
Reclaim hopper & feeder	1	Feeder Belt, Rex Chainbelt Inc.	n/a	n/a	1968	Hopper: 20 cy Belt feeder: 42" wid. x 20' centers	150 tph, 1,533,000 tpy	Existing
No. 2 main inclined conveyor	1	n/a	50 HP motor	n/a	1982	24" width by 625' length	300 tph, 2,628,000 tpy	Existing
No. 3 inclined conveyor	1	Boston Dulon 600	3 -ply	n/a	1982	30" width by 439' length	300 tph, 2,628,000 tpy	Existing
Delumper at oxygen furnace charge system	1	Jeffrey Manufacturing Division	Jeffrey 5WR5 /Reversible impactor	13492	1982	n/a	300 tph, 2,628,000 tpy	Existing
No. 4 Horizontal Conveyor	1	Boston Dulon 600	4-ply	n/a	1982	42" width by 139' length	300 tph, 2,628,000 tpy	Existing
Flash Furnace Building Operations:								

Table 1 Process and Control Equipment Description								
Equipment	**Quantity**	**Manufacturer**	**Model/Type**	**Serial No.**	**Date Installed or modified**	**Size**	**Rated Capacity**	**New or Existing**
Wet bin conveyors, dryer feed & weigh belts	4	ASARCO design	n/a	n/a	1983	30" width	85 tph, 744,600 tpy	Existing
Hammer Mill	1	Pennsylvania Crusher Corporation	GRT#1	n/a	1983	42" x 12" x 31"	6tph, 52,560 tpy	Existing
Nos. 1 & 2 Fluid bed dryers with burners	2	Fuller	11-81-20337-106 Farrier natural gas burners	n/a	1983	11'3" diameter (ID shell) x 26' high	Production: 64 wet ton/hr, 560,640 tpy Burner firing gas: 38,000 CFH x 2 burners Burner firing oil: 270 gph x 2 burners Maximum dryer usage: 6,915 hours per year	New
Blow tank pneumatic conveyor (hammer mill feeds surge bin then material drops into line with air blown to dry dust bin)	1	Fuller/Abresist	n/a	n/a	1983	4"	4.2 tph, 36,792 tpy	Existing
Fluid bed dryer product baghouse Nos. 1 & 2	2	Peabody Process Systems, Inc.	PMTR-10-1692 TW Pulse	n/a	1982	n/a	Gas flow rate: 55,000 ACFM	New
Dry screw conveyors #1-8, furnace charge system	8	FMC	n/a	n/a	1983	16" and 9" width	56.9 tph, 498,444 tpy	Existing
Feed screw conveyors #10-16, furnace charge system	7	FMC	n/a	n/a	1983	12" width	n/a	Existing
200-ton west wet bins nos. 1 & 2	2	n/a	n/a	n/a	1983	n/a	n/a	Existing

Table 1 Process and Control Equipment Description								
Equipment	**Quantity**	**Manufacturer**	**Model/Type**	**Serial No.**	**Date Installed or modified**	**Size**	**Rated Capacity**	**New or Existing**
200-ton dry bins nos. 1 through 4, each served by one ventilation baghouse	4	DCE Vokes	DLM V10/10 F3 20 envelope filter bags	n/a	1983	Cloth area: 105 sq. ft.	1050 acfm	Existing
30-ton dust bin no. 1 served by a ventilation baghouse	1	BHA	4 Cartridge Filters	n/a	1998	Cloth area: 480 sq. ft.	1200 acfm	Existing
30-ton flux bin no. 3 served by a ventilation baghouse	1	Fuller	Pulse	n/a	1983	Cloth area: 166 sq. ft.	1200 acfm	Existing
Oxygen flash furnace with burner (smelter and concentrator)	1	Inco	with oxygen burner	n/a	1983	24 ft. x 80 ft.	24,000 tpd concentrates When process is down, furnace is kept hot with up to 4 natural gas burners. Maximum gas usage is 91,113 CFH.	New
WGHS Venturi Scrubber	1	Swemco Inc.	SW-A-138696 Variable throat	14520	August, 1997	42" inlet diameter	flow rate 62,913 acfm	n/a
WGHS Disengagement vessel	1	Swemco Inc.	SW-A-138696	14525-100	August, 1997	5' diameter inlet	flow rate 62,913 acfm	n/a
WGHS Condensing Heat Exchanger	1	Fleck, Ltd.	95-336 Shell & tube	1781	1997	8' diameter vessel	80 MBtu/hr heat exchange	n/a
WGHS Saturation Tower	1	Structural Steel and Fabrication Company	Refractory lined wet tower	n/a	fourth quarter 1997	25' high x 8' dia.	125,168 acfm	n/a
WGHS Stripping Tower	1	Structural Steel and Fabrication Company	Disk and Do-nut	n/a	fourth quarter 1997	34' high x 3' dia.	1,032 acfm	n/a
Revert								

Table 1 Process and Control Equipment Description								
Equipment	**Quantity**	**Manufacturer**	**Model/Type**	**Serial No.**	**Date Installed or modified**	**Size**	**Rated Capacity**	**New or Existing**
Crushing System:								
Feeder	1	Kue-Ken	Hydro stroke feeder	270	1980	n/a	200 tph, 42,000 tpy	New
Jaw Crusher	1	Kue-Ken	n/a	11011781	1980	25' x 42'	200 tph, 42,000 tpy	New
Vibrating screen	1	Tyler Industry	R1204X	502626	1980	n/a	200 tph, 42,000 tpy	New
Cone crusher	1	Kue-Ken	n/a	3095132	1980	n/a	200 tph, 42,000 tpy	New
Belt conveyors	2	Kue-Ken	BC-203 and BC-206	n/a	1980	n/a	200 tph, 42,000 tpy	New
Revert crushing baghouse	1	Peabody Process Systems, Inc.	PMTR-10-592W pulse	01-5011-01	1989	6,974 sq. ft.	32,000 acfm	New
Converter Building:								
Converters	5	n/a	Pierce Smith Each converter has a natural gas burner to keep vessel heated during holding fire.	n/a	1969	one with 13'x35', one with 13'x30' and three with 13'x33'	100 tons copper per cycle 170 tons matte per cycle 40 tons cold dope per cycle Maximum gas usage: 17,695.8 CFHx1.5 converters	Existing
Converter silica conveying system	1	B.F. Goodrich for belts	Consists of three unloading hoppers with conveying belts	n/a	1968	24" belts 44.3' length	60 tph, 525,600 tpy	Existing
Converter primary hooding	5	ASARCO design	Steel	n/a	1999/2000	length 10.28 feet	n/a	Existing
Converter cyclones	10	Ducon	Model 1000 with high efficiency duclones	n/a	1966 and 1968	1000	n/a	Existing
Converter spray chamber	1	ASARCO	Spray	n/a	1973	n/a	n/a	Existing
Converter	1	ASARCO	n/a	n/a	1979	n/a	n/a	Existing

Table 1 Process and Control Equipment Description								
Equipment	**Quantity**	**Manufacturer**	**Model/Type**	**Serial No.**	**Date Installed or modified**	**Size**	**Rated Capacity**	**New or Existing**
secondary hooding		design						
Secondary hoods baghouse	1	Hosakawa Mikropul	1000 J-10-30-TRH pulse type	950281 H1-H7	1996	Seven modules with 11,780 sq. ft. per module	300,000 acfm total working volume, 0.1158 gr/dscf maximum dust loading, and 0.0861 gr/dscf inlet loading	n/a
Gas Cleaning Plant:								
Process gas precipitators	4	Chemiebau	Four train	n/a	1969	n/a	200,000 scfm	n/a
Gas Scrubbers	5	Rust Engineering	Open towers (3) and packed (2)	n/a	1961	n/a	n/a	n/a
Mist precipitators	8	ASARCO design	Mist wet ESP Gas flows through 4 parallel trains, each 2 units deep, thus 4 inlets and 4 outlets	n/a	1983	180 tubes 15 foot length	n/a	n/a
Gas cleaning plant pugmill	1	ASARCO	n/a	n/a	1967	n/a	n/a	n/a
Acid Plant:								
Acid plant	1	Monsanto	double contact	n/a	1983	n/a	2,820 STPD (100% acid basis) as 93% H2SO4 using 12.4% SO2 24,703,200 STPY	n/a
Acid plant preheater	1	Thermal Transfer Corporation	Natural gas fired	n/a	1983	22.75'x8' O.D. shell	40,000 scfm of start up air 107,925 CFH max. fuel input	Existing
Anode Plant:								

Table 1 Process and Control Equipment Description								
Equipment	**Quantity**	**Manufacturer**	**Model/Type**	**Serial No.**	**Date Installed or modified**	**Size**	**Rated Capacity**	**New or Existing**
Anode furnaces #1 & #2 with burners, Anode furnace #3 with burners (spare)	3	n/a	Fuller Co. Natural gas fired	n/a	1971	13'x35'	330 ton per furnace Gas usage for both furnace: 648 cfm max. measured and 736.7 cfm (402 gph) max. estimated	Existing
Anode steam boiler	1	Parker	Packaged boiler horizontal drum, natural gas fired	n/a	1995	90 HP	3,780,000 Btu/hr	Existing
Anode casting wheels, north & south	2	Stearns-Rodgers Corporation	n/a	n/a	1972	29' diameter	24 mold	Existing
Anode launder burners	6	Hauck	RFS 1120A Natural gas fired	n/a	1972	2"	n/a	Existing
Anode ladle burners	3	ASARCO	Natural gas fired	n/a	1972	4"	n/a	Existing
Oxygen Plant:								
Oxygen plant boiler	1	General Electric	CB Packaged Boiler 700X-300, natural gas fired	L-75227	1982	n/a	8,740,000 Btu/hr 8,740 CFH designed natural gas usage	Existing
Oxygen plant	1	Air Products	Consists of main air compressor, oxygen compressor, direct contact after cooler, liquid oxygen storage tank and cooling tower	n/a	1983	n/a	650 tpd gaseous oxygen 5,694,000 tpy	Existing
Furnace Ventilation								

Table 1 Process and Control Equipment Description								
Equipment	**Quantity**	**Manufacturer**	**Model/Type**	**Serial No.**	**Date Installed or modified**	**Size**	**Rated Capacity**	**New or Existing**
Gas Control:								
R & R Electrostatic precipitator	1	ASARCO Inc.	Plate wire	n/a	built in 1961 and expanded in 1968	62'x76'	43,350 dscfm	n/a
R & R ESP screw conveyors #1-15, 17, 18	17	Screw Conveyor Corporation	n/a	n/a	1968	#1-15: 9" #17, 18: 12"	12 tph, 105,120 tpy	Existing
R & R ESP Bucket Elevator	1	Automation Supply	3-SA	n/a	1975	48' center to center	35 tph, 306,600 tpy	Existing
R & R ESP Pugmill	1	Automation Supply & Engineering	Double shaft	n/a	1968	n/a	15 ton storage	Existing
Other Processes:								
Reverts (matte & slag) Screen #1, south of acid tanks	1	Screen USA	BF35E2/two deck 4'x8' for closed single deck and 12'x14' for open single deck	3011096	1996	4'x8' and 12'x14'	100 tph, 44,000 tpy	New
Reverts (matte & slag) Screen #2, south of converter isle	1	Grizzly	Open single deck	n/a	1994	10'x15' 33/34" openings	200 tph, 40,000 tpy	New
WTP lime silo	1	Portec	850-QLH/Steel	n/a	1983	n/a	150 ton	Existing
WTP lime silo baghouse	1	Portec	DF-44	n/a	1983	1 HP	1,176 cfm	n/a
0.5 million gallon diesel storage tank	1	Garland Steel Company	steel	n/a	fourth quarter 1971	500,000 gallons diameter 52 feet height 32 feet	n/a	Existing

Table 2 Stack Information						
Identification	**Description**	**Building Size**	**Exit Gas Temperature**	**Exit Gas Velocity**	**Height**	**Inside Dimensions**
HP-1	Acid plant (main stack core)	n/a	303 EF	19 fps	1000 feet	17 foot diameter
HP-2	Main stack annulus (ventilation gases)	n/a	135 EF	34 fps	920 feet	432 sq. ft.
HP-4	Revert crusher baghouse stack	n/a	99 EF	42 fps	46 feet	3.83 foot diameter
HP-26	#2 acid plant preheater	n/a	n/a	n/a	65 feet	5.42 foot diameter
HP-28	Oxygen plant boiler	n/a	346 EF (estimated)	1,650 scfm (estimated)	22 feet	1.66 foot diameter
HP-32	200 ton dry #1 bin ventilation baghouse (located inside furnace building)	n/a	Unknown	Capacity 1050 acfm	6 feet	0.5' x 0.5'
HP-33	200 ton dry #2 bin ventilation baghouse (located inside furnace building)	n/a	Unknown	Capacity 1050 acfm	6 feet	0.5' x 0.5'
HP-34	200 ton dry #3 bin ventilation baghouse (located inside furnace building)	n/a	Unknown	Capacity 1050 acfm	6 feet	0.5' x 0.5'
HP-35	200 ton dry #4 bin ventilation baghouse (located inside furnace building)	n/a	Unknown	Capacity 1050 acfm	6 feet	0.5' x 0.5'

Table 2 Stack Information						
Identification	**Description**	**Building Size**	**Exit Gas Temperature**	**Exit Gas Velocity**	**Height**	**Inside Dimensions**
HP-38	30 ton dust bin ventilation baghouse #1 (part of pneumatic conveying system)	n/a	Ambient	Capacity 480 acfm	12.25 feet	0.68' x 0.66'
HP-39	30 ton dust bin ventilation baghouse #2 (part of pneumatic conveying system)	n/a	Ambient	Capacity 480 acfm	12.25 feet	0.68' x 0.66'
HP-50	Anode steam boiler	n/a	n/a	n/a	32 feet	20 inch diameter

Table 3 Continuous Emission Monitoring Systems Information					
Type	**Manufacturer**	**Model**	**Serial No.**	**Range**	**Location**
Acid Plant Tail Gas SO_2 Monitor	Ametek	4600B - Analyzer 4000 - Control Station	6146	0-0.20% SO_2	At the acid plant exit prior to the merging with the main flue to stack
Acid Plant Tail Gas Flow Monitor	EMRC/Rosemount	Mark 5/ 3051CD1A22A1AB4M5	0306343	0-2.5 "H_2O Dp S-Type Pitot	At the acid plant exit prior to the merging with the main flue to stack
Acid Plant Tail Gas Opacity Monitor	Lear Ziegler	1100M	0833	0-100% opacity	At the acid plant exit prior to the merging with the main flue to stack
R & R Flue Opacity Monitor	Monitor Labs	550	5500157	0-100% opacity	At outlet flue of the R & R Cottrell ESP prior to the merging with the secondary hoods off-gas flue
Converter Secondary Hoods Off-gas SO_2 Monitor	Ametek	4600B - Analyzer 4000 - Control Station	5289	0-1.0% SO_2	At the secondary hooding flue before baghouse
Converter Secondary Hoods Off-gas Flow Monitor	EMRC/Rosemount	Mark 5/ 3051CD1A22A1AB4M5	86585	0-2.5 "H_2O Dp S-Type Pitot	At the secondary hooding flue before baghouse
Furnace Ventilation Gas SO_2 Monitor	Ametek	4600B - Analyzer 4000 - Control Station	6274	0-0.4% SO_2	At the furnace vent flue prior to the merging with dryer exhaust gases
Furnace Ventilation Gas Flow Monitor	EMRC/Rosemount	Mark 5/ 3051CD1A22A1AB4E5	0538569	0-2.5 "H_2O Dp S-Type Pitot	At the furnace vent flue prior to the merging with dryer exhaust gases

Table 4
Ambient Sulfur Dioxide Analyzers in the Hayden Area

Identifier	Unit	Make/Model	Owned and Operated by	Location
MT0	Montgomery Ranch	Thermo Environmental pulsed fluorescent Model 43B	ASARCO	2.52 miles northwest of ASARCO
JL	Jail - ASARCO	Thermo Environmental pulsed fluorescent Model 43C	ASARCO	0.58 miles west of ASARCO
HJ0	Hayden Junction	Thermo Environmental pulsed fluorescent Model 43B	ASARCO	2.00 miles west of ASARCO
GA	Garfield Avenue	Thermo Environmental pulsed fluorescent Model 43C	ASARCO	0.56 miles south of ASARCO
GH0	Globe Highway	Thermo Environmental pulsed fluorescent Model 43B	ASARCO	0.50 miles east of ASARCO
JL	Jail - ADEQ	Thermo Electron pulsed fluorescent (TECO) Model 40	ADEQ	0.58 miles west of ASARCO

Table 5
Ambient PM_{10} Samplers in the Hayden PM_{10} Nonattainment Area

Identifier	Unit	Make/Model	Owned and Operated by	Location
JL	Hayden Old Jail - ADEQ	Tapered Element Oscillating Microbalance Technology (TEOM)	ADEQ	0.58 Miles west of ASARCO
RS	Riverside Maintenance Yard	Anderson Hi-Vol	Pinal County Air Quality Control District	15.5 Miles northwest of Hayden

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Appendix E
ADEQ Memo Certifying Air Quality Data for the Hayden Area

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ADEQ Arizona Department of Environmental Quality Memorandum

Date: December 1, 2009

To: Ira Domsky, Deputy Director
Air Quality Division

Through: Steven Peplau, Section Manager
Air Assessment Section

From: Sandra Wardwell, Unit Manager
Data Management & QA Unit

Subject: Evaluation of QA/QC information for Pb samples collected by EPA in Hayden and Winkelman

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EPA Region 9 Superfund began environmental sampling in the Hayden-Winkelman area in November 2006. Air quality samples of particulate matter were analyzed by a contract laboratory (Chester LabNet). The analytical results for lead (Pb) from samples collected in 2006-2008 were used by ADEQ to recommend the Hayden area as nonattainment for Pb under the revised NAAQS. ADEQ reported these data collected at the EPA Superfund sites in Hayden and Winkelman to the EPA Air Quality System (AQS) database on August 27, 2009, listing EPA Region 9 as the Primary Quality Assurance Organization (PQAO) and ADEQ as the Reporting Organization.

This document describes ADEQ's assessment of the quality assurance procedures used by EPA Region 9 Superfund for collection and validation of the air quality samples.

DOCUMENTS

Project Plans

The EPA contracted CH2M Hill to conduct site characterization and remedial activities at the ASARCO LLC Hayden Plant Site in 2005. CH2M Hill submitted a sampling and analyses plan to EPA consisting of 3 documents in November 2005:

- Quality Assurance Project Plan (QAPP)
- Field Sampling Plan (FSP)
- Data Management Plan (DMP)

The QAPP was prepared following EPA guidelines:

- EPA guidance for Quality Assurance Project Plans (2002)
- EPA Requirements for Quality Assurance Project Plans (2001)

Collection of air samples began in November 2006. The QAPP describing Project Management/Data Quality Objectives, Measurement Data Acquisition, Assessment/Oversight, and Data Validation and Usability was in place prior to the start of sampling.

CH2M Hill was the contractor for the remedial investigation from 2005 to 2009. ITSI assumed the contract in 2009. ITSI added addendums to the sampling and analysis plan documents to change the responsible parties listed in the plans.

These documents were obtained from the ITSI ftp website.

INSTRUMENTATION

Two Partisol-Plus Model 2025 Sequential Air Samplers are being used for this project. This samples has an EPA PM_{10} reference designation of RFPS-1298-127. The designation was given in December, 1998. These samplers also meet the CFR requirements for PM_{10} coarse samplers ($PM10_C$) since a Federal Register notice published June 2, 2009 (page 26395), announced this sampler received designation for coarse (PM_{10} -$PM_{2.5}$) sampling as part of a pair of samplers with a new reference designation of RFPS-0509-176. This sampler meets the requirements of 40 CFR 50 Appendices Q and R.

Field Sheets
Calibration and flow checks for the air quality samplers at the Winkelman and Hayden monitoring sites were conducted as scheduled in the QAPP. Review of the field sheets indicates one monthly flow check could not be completed due to a pump failure at the Hayden monitor (August 21, 2008). Chain of custody information for the samples collected since the last good check (August 18, 2008) were reviewed to determine if the prior samples were valid. All samples are valid; the pump failure occurred on the day of the check. Consequently, repairs to the sampler were made and the next valid sample occurred on September 12, 2008.

These documents were obtained from the ITSI ftp website.

Chain of Custody Forms and Laboratory Reports.
Chain of custody information was collected for each sample. This information is included in the Laboratory reports, which also include a statement certifying the validity of the results, and precision, accuracy, and replicate results. The reports also include a Transmittal Memorandum with each batch of filters from the consultant to the laboratory. This memorandum lists the valid filters to be processed and also lists the invalid filters.

These reports were obtained from ITSI.

DATA

The DMP states in Section D.1, 'All data for all parameters will undergo two levels of review and validation: 1)at the laboratory, and 2) outside the laboratory by the EPA quality Assurance Management Section or their designee." The laboratory prepared and shipped all filters to the consultant. The consultant loaded the samplers and collected the filters after the sampler ran. The consultant's transmittal memorandum accompanying the filters and chain of custody information to the laboratory lists valid and invalid filters. This indicates the field personnel were invalidating samples if the sampler was not operating correctly or if the filter was damaged during loading and unloading of the sampler. The laboratory analyzed the valid filters.

A spreadsheet of validated data was obtained from John Hillenbrand, EPA Region 9 in May, 2009. This file lists analytical results for samples collected 10/22/2006 through May 13, 2009. These results had been reviewed and certified by the contract laboratory (see Chain of Custody Forms and Laboratory Reports above). ADEQ assumed EPA reviewed the data results since validation flags, graphs and other information was included in the spreadsheet.

Preliminary Report

CH2M Hill submitted a Technical Memorandum to EPA on December 31, 2008 entitled, "Preliminary Evaluation of PM_{10} and Metals Concentrations from October 2007 to December 2008 in Ambient Air at the Hayden and Winkelman Monitoring Stations". The report used results from samples collected 11/13/2007 through 11/30/2008. Several samples are labeled 'rejected' with no reason given in the tables of analytical and meteorological results. Footnote 28 to Tables 1 and 2 states: "This table should be considered preliminary and will be revised based on incoming data, final data validation and QAQC."

The report identifies three 3-month means in exceedance of the NAAQS at the Hayden monitoring station in 2008.

The report was obtained from EPA Region 9, John Hillenbrand.

CONCLUSIONS

1. A QAPP was submitted to EPA in November 2005, prior to the start of sampling in October 2006. This complies with the EPA requirement for air monitoring programs to have an approved QAPP prior to the start of sampling.

2. Addendums to the QAPP documents were made by the new consultant in March 2009.

3. Instrument checks were performed as described in the Field Sampling Plan. Copies of the checks are available ITSI.

4. Laboratory reports contain chain of custody information, transmittal information, and laboratory quality control data along with the analytical results.

5. ADEQ's review of the above information concludes the lead data provided by Region 9 Superfund has experienced at least 3 levels of validation, (sampler field checks and verification of sample validity immediately after collection, laboratory analysis and quality control checks of laboratory procedures, and review by EPA Superfund staff. These procedures are comparable to the procedures followed by ADEQ air assessment staff.

6. The preliminary report by CH2M Hill omitted several sample results that were included in the EPA spreadsheet. CH2M Hill footnotes do not indicate why those samples were omitted but do state that additional validation and QA/QC could change the results included in the report. ADEQ review of all the QA/QC documentation supports EPA’s determination that the samples and the data generated from those samples were valid.

7. All violations of the 2008 Pb NAAQS calculated by ADEQ and included in the recommendation to designate the Hayden area as nonattainment are accurate and valid.

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Appendix F

ASARCO Contractor Zephyr Environmental Corporation
Report on ADEQ's Pb Boundary Recommendation

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REVIEW OF
ARIZONA DEPARTMENT OF ENVIRONMENTAL QUALITY'S
TECHNICAL SUPPORT DOCUMENT
FOR THE DEPARTMENT'S
PROPOSED BOUNDARY RECOMMENDATION
FOR THE 2008 REVISION OF THE NAAQS FOR LEAD

Prepared for:

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NOVEMBER 10, 2009

CONTENTS

APPENDICES

Appendix A Hayden Air Quality Monitoring Results, Received from EPA on September 23, 2009

EXECUTIVE SUMMARY

In a September 28, 2009 document entitled "Arizona Air Quality Designations Technical Support Document Boundary Recommendation for the 2008 Revision to the National Ambient Air Quality Standard for Lead" (TSD), the Arizona Department of Environmental Quality (ADEQ) made a proposal that the Governor should recommend to the U.S. Environmental Protection Agency (EPA) that portions of Gila and Pinal Counties (hereinafter the Hayden area) be designated as being in nonattainment of the National Ambient Air Quality Standard (NAAQS) for lead. The ADEQ's proposal is based on air monitoring data collected in the Hayden area as part of a remedial investigation in a CERCLA proceeding between the EPA, ADEQ and ASARCO LLC (Asarco).

Asarco retained Zephyr Environmental Corporation (Zephyr) to review the TSD underlying the ADEQ's proposal.

Zephyr's review identified the following issues:

- Some of the monitored lead values relied upon in the TSD are associated with "exceptional events" under 40 CFR Part 50 and ADEQ guidance and should therefore not be counted toward determining whether the Hayden area is in nonattainment of the NAAQS for lead. When these "exceptional events" values are excluded there are no monitored values above the NAAQS.
- The Hayden monitor is located on top of the Town of Hayden maintenance building. Given the soldering/welding activities and vehicle traffic that take place at the maintenance yard, the potential exists for contamination of the samples obtained using the monitor.
- The Quality Assurance (QA) plan governing the Hayden monitor and the results of the various tests and calibrations required under the quality assurance rules governing ambient air monitors were not available at the time of Zephyr's review. As of the date of the TSD, the ADEQ had not reviewed information on the required quality assurance checks of the Hayden monitor, and it remains uncertain whether such checks occurred. This calls into question the validity of the data generated using the monitor.
- In support of the ADEQ's proposal, the TSD (at Table 4-1) compares 3-month means to the NAAQS. However, the TSD does not demonstrate the ADEQ validated the 3-month means according to 40 CFR Part 50, Appendix R Section 4(c) procedures. If these procedures were followed, it would be found that all the 3-month means above the lead NAAQS do not meet the specific 75% data completeness requirement.
- The Design Value (i.e., the single mean concentration that is required under the rules to be compared to the NAAQS to demonstrate attainment or nonattainment) was not clearly identified or adequately discussed in the TSD.

Based on these findings, the proposed nonattainment designation for the Hayden area is unwarranted. In order to make a defensible proposal of a nonattainment designation, more representative, quality controlled and quality assured data are needed, and the data need to be

evaluated properly under the rules at 40 CFR Part 50, Appendix R and ADEQ guidance, including the effect of exceptional events and data validation.

1.0 BACKGROUND

ASARCO LLC (Asarco) conducts beneficiation and smelting of copper ores at its Ray Complex-Hayden Operations in Hayden, Arizona, approximately 80 miles east-southeast of Phoenix and 60 miles north of Tucson. In April 2008 a CERCLA Administrative Settlement Agreement and Order on Consent (Settlement Agreement) was entered into by the U.S. Environmental Protection Agency (EPA), the Arizona Department of Environmental Quality (ADEQ) and Asarco. One of the stipulations of the Settlement Agreement was that Asarco conduct a Remedial Investigation/Feasibility Study (RI/FS), which among other things called for the continuation of air quality monitoring that the EPA had already begun in the Hayden area. That monitoring addressed several air pollutants, one of which was lead.

On November 12, 2008 the EPA revised the National Ambient Air Quality Standard (NAAQS) for lead.[1] The revised NAAQS was established at 0.15 $\mu g/m^3$ on a rolling three-month averaging period.

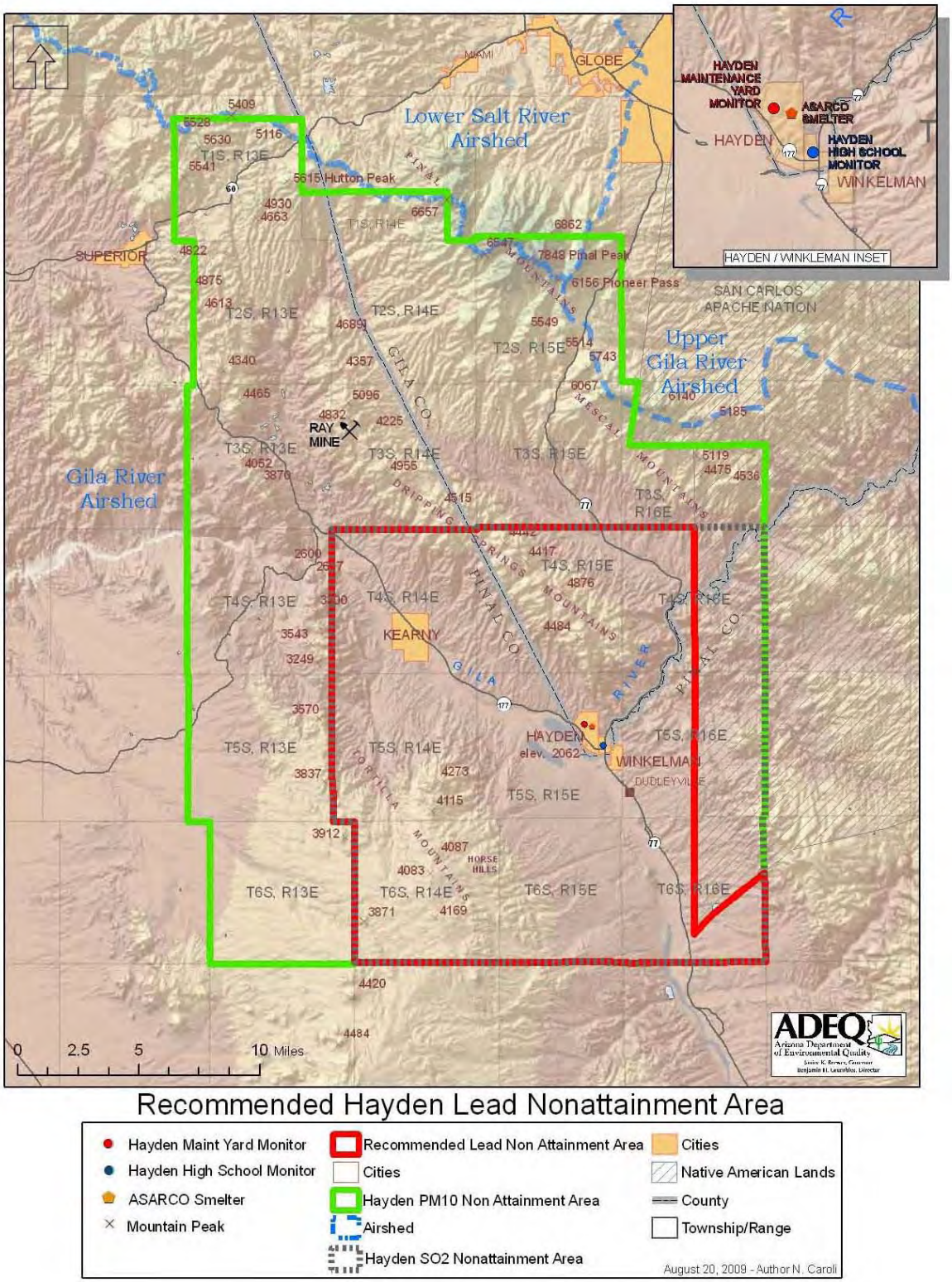
On September 28, 2009 the ADEQ completed a Technical Support Document[2] (TSD) in which it proposed that the Governor recommend to the EPA a designation of portions of Gila and Pinal Counties as being in nonattainment of the revised NAAQS for lead. The proposed nonattainment area is presented in Figure 1-1.

Asarco retained Zephyr Environmental Corporation (Zephyr) to review the ADEQ's proposal. In its review, Zephyr evaluated both the technical and the regulatory merits of the ADEQ's proposal.

This report documents Zephyr's findings.

[1] 73 Fed. Reg. 66964.

[2] "Arizona Air Quality Designations Technical Support Document Boundary Recommendation for the 2008 Revision to the National Ambient Air Quality Standard for Lead," Air Quality Division, ADEQ.



Recommended Hayden Lead Nonattainment Area

- Hayden Maint Yard Monitor
- Hayden High School Monitor
- ASARCO Smelter
- Mountain Peak
- Recommended Lead Non Attainment Area
- Cities
- Hayden PM10 Non Attainment Area
- Airshed
- Hayden SO2 Nonattainment Area
- Cities
- Native American Lands
- County
- Township/Range

August 20, 2009 - Author N. Caroli

Figure 1-1
ADEQ Proposed Lead Nonattainment Area for Hayden, Arizona
(taken from ADEQ's TSD)

2.0 ISSUES IDENTIFIED

Zephyr identified several issues which, to varying degrees, call into question the ADEQ's proposal of the Hayden area as nonattainment for lead. These issues are elaborated upon below.

2.1 EXCEPTIONAL EVENTS

40 CFR Part 50 defines an exceptional event as "an event that affects air quality, is not reasonably controllable or preventable, is an event caused by human activity that is unlikely to recur at a particular location or a natural event…" 40 CFR 50.14(c)(3)(iv) presents the criteria that must be met for an event to be deemed exceptional under this rule:

- The exceptional event is a cause of the monitored value,
- The event in question is beyond normal historical fluctuations, and
- There would not have been an exceedance of the NAAQS without this event.

Should a monitored value be excluded for being associated with an exceptional event, 40 CFR 50.14(b) stipulates that those excluded data are not to be included in a determination of an exceedance of a NAAQS.

On October 15, 2009, the ADEQ issued a report entitled "The Impact of Exceptional Events 'Unusual Winds' on PM_{10} Concentrations in Arizona"[3] that provides guidance as to how to determine what constitutes an exceptional event in terms of winds. The report considered historical environmental and meteorological data, including data from Hayden. One of the conclusions of the report was as follows:

Recent ADEQ guidance supports the determination that three days in late 2008 are "exceptional events." When they are removed, the revised Design Concentration is below the NAAQS.

> *For exceptional events purposes, "unusual winds" can be defined as any wind that has the ability to create wind blown dust. Literature and data from monitors indicate that the phenomenon of blowing dust can occur over a broad range, but generally is associated with hourly averaged wind speeds that are above 10 miles per hour, which are commonly associated with wind gusts over 20 miles per hour.*

As a first step Zephyr reviewed both lead concentrations and wind speeds for the entire year of 2008 to identify any potential relationship between the two. As shown in Figure 2-1, there clearly is a correlation between three-month average lead concentrations observed at the

[3] "The Impact of Exceptional Events 'Unusual Winds' on PM_{10} Concentrations in Arizona", ADEQ Air Quality Division (October 15, 2009).

Hayden monitor and three-month average wind speeds observed at the same monitor. Both the three-month average lead concentrations and wind speeds are at their lowest in the spring, then attain an intermediate maximum in June, and then reach their greatest values in the late fall.

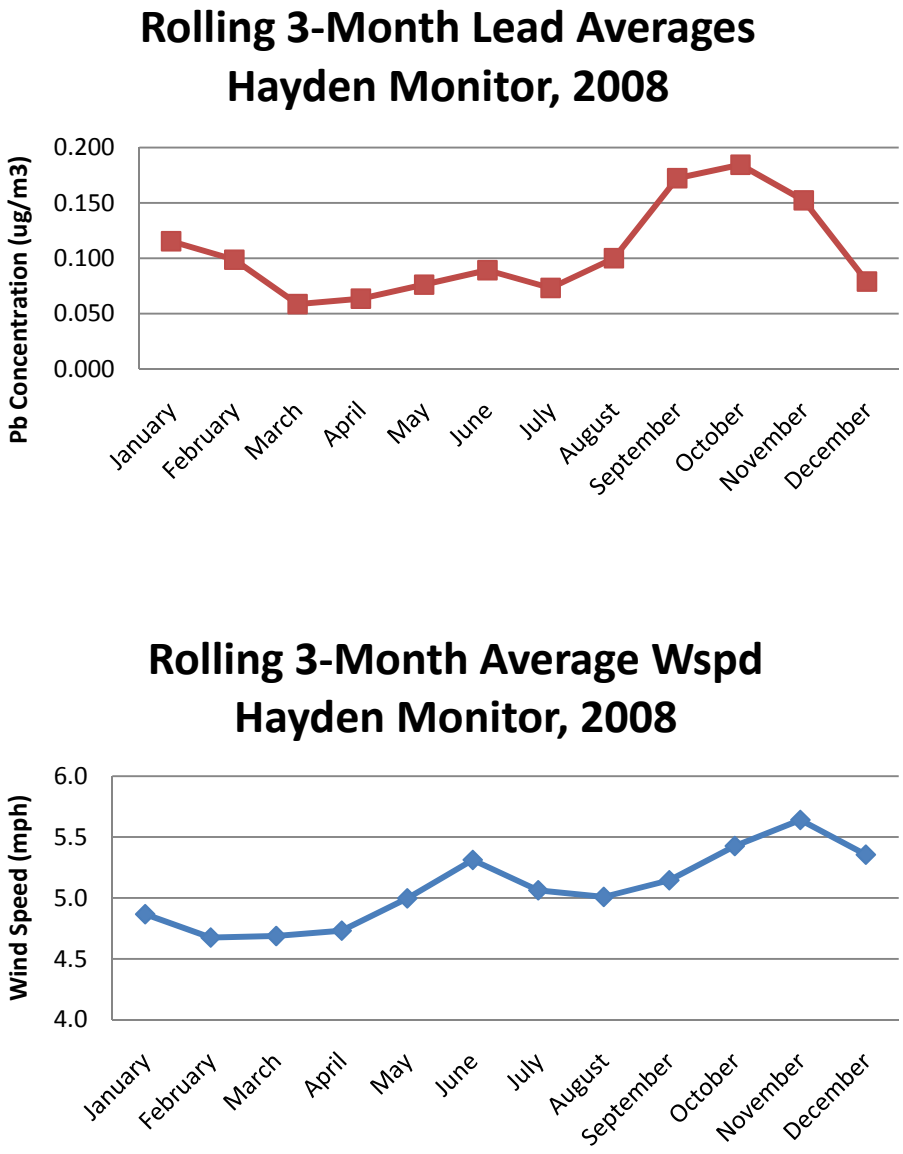


Figure 2-1
Average Lead Concentrations and Wind Speed Observed at Hayden Monitor, 2008

A single short-term (e.g., an hour) concentration at a monitor that is extraordinarily high can lead to a high 24-hr concentration (even with the rest of the 24-hr period having fairly low impacts). This is illustrated, by way of example, by the data in Figure 2-2, taken from a continuous PM_{10} monitor located at the University of Texas at El Paso (EPA ID # 481410037).

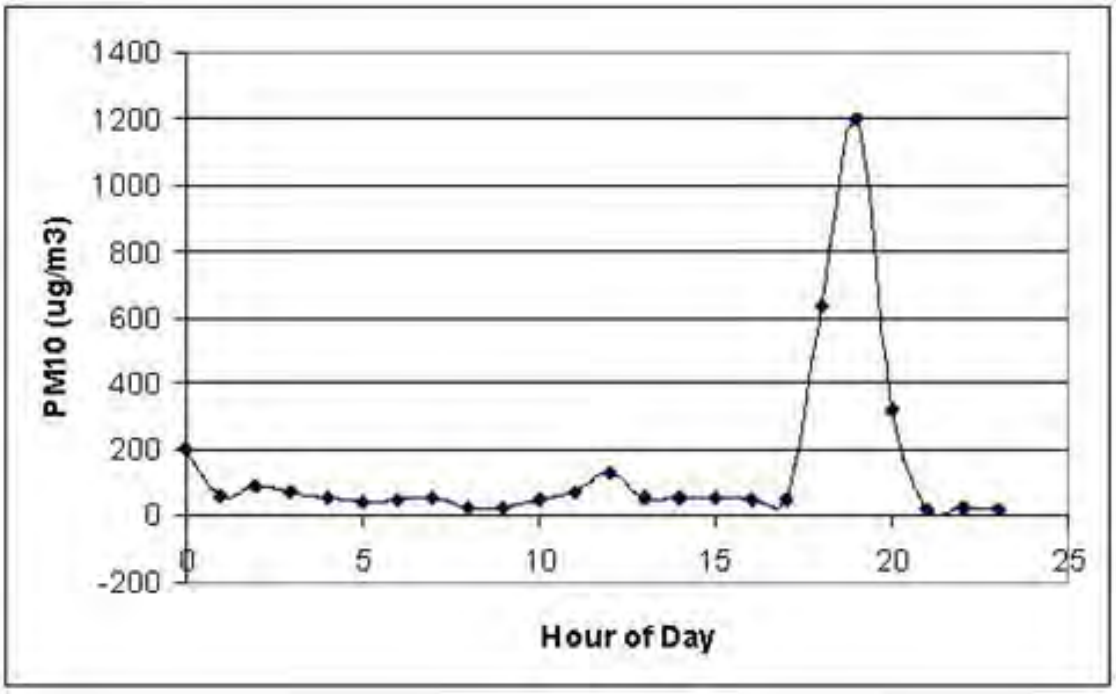


Figure 2-2
Example of One Hour of Elevated Concentration Leading to High 24-hr Concentration

As shown in the figure above, the vast majority of the hourly PM_{10} concentrations on this day are below the 24-hr NAAQS of 150 µg/m^3. However, the overall daily average is radically affected by several very high individual hourly monitored values (although not indicated on this plot, the high concentrations were associated with winds in excess of 10 mph), ultimately leading to a 24-hr concentration greater than the NAAQS.

Therefore, a day that has a single hourly average wind speed of 10 mph or greater is a candidate for being an exceptional event (note that this discussion focuses on *average* winds, not a wind gust which would be higher than the hourly average) in the context of 40 CFR 50.14(c)(3)(iv). However, for the sake of conservatism Zephyr decided to focus only on days with more than one hour of average wind speeds greater than 10 mph.

An examination of the meteorological data gathered at Hayden during the months of July through November, inclusive, in 2008 (the months whose data are associated with all calculated lead NAAQS exceedances as presented in the TSD) revealed that only three days had more than one average hourly wind speed greater than 10 mph. Details on these days are presented below (note that the plots show both average hourly winds as well as average 30-minute winds).

2.1.1 Dates Deemed to Have Exceptional Wind Speeds

2.1.1.1 August 5, 2008

On August 5, 2008 there were two hourly average wind speeds at the Hayden monitor in excess of 10 mph. These two wind speeds occurred at 7:00 PM and 8:00 PM (with the 6:00 PM wind speed being 9.6 mph). Therefore, this day experienced a concentrated period of exceptionally high winds in the evening. More information concerning the winds of that day is presented in the table to the right.

August 5, 2008 Wind Speed Information	
Maximum 30-min Wind Speed	18.6 mph
Maximum Hourly Wind Speed	16.1 mph

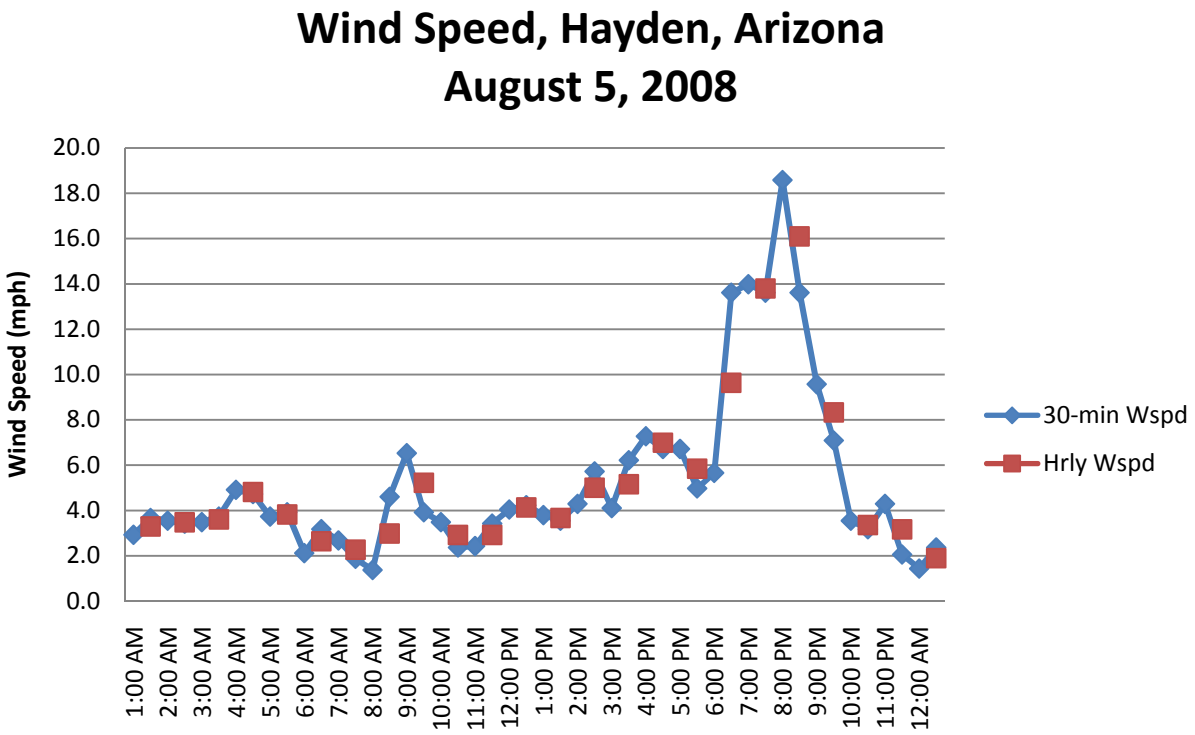


Figure 2-3
Hayden Monitor Average 30-Minute and Hourly Wind Speeds
August 5, 2008

2.1.1.2 September 30, 2008

On September 30, 2008 there were five hourly average wind speeds at the Hayden monitor in excess of 10 mph. These five wind speeds occurred between 6:00 AM and 11:00 AM, with the 8:00 AM wind speed being just below 10 mph. Therefore, this day experienced a concentrated period of exceptionally high winds in the morning. More information concerning the winds of that day is presented in the table to the right.

September 30, 2008 Wind Speed Information	
Maximum 30-min Wind Speed	12.9 mph
Maximum Hourly Wind Speed	12.3 mph

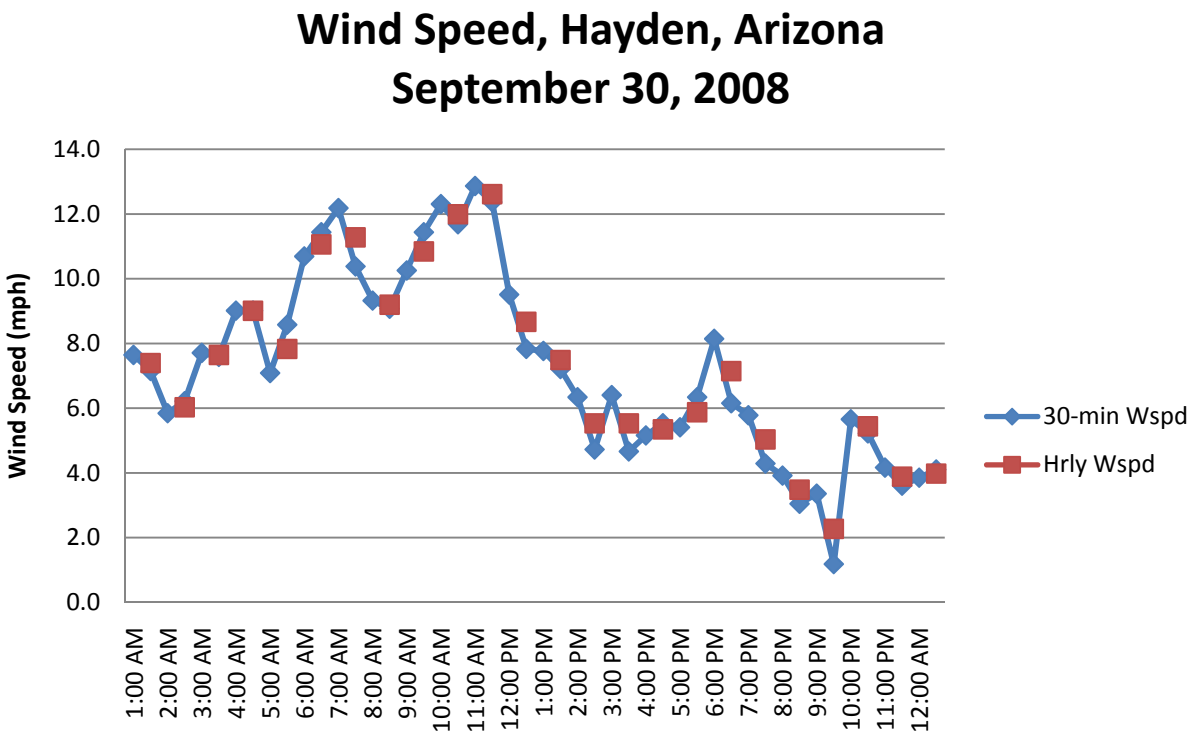


Figure 2-4
Hayden Monitor Average 30-Minute and Hourly Wind Speeds
September 30, 2008

2.1.1.3 October 22, 2008

On October 22, 2008 there were ten hourly average wind speeds at the Hayden monitor in excess of 10 mph. Eight of these wind speeds occurred between 10:00 AM and 5:00 PM (note the 9:00 AM wind speed was 9.9 mph), with the other two occurring at 11:00 PM and midnight. Therefore, this day experienced a concentrated period of exceptionally high winds throughout a substantial portion of the day. More information concerning the winds of that day is presented in the table to the right.

October 22, 2008 Wind Speed Information	
Maximum 30-min Wind Speed	18.5 mph
Maximum Hourly Wind Speed	18.1 mph

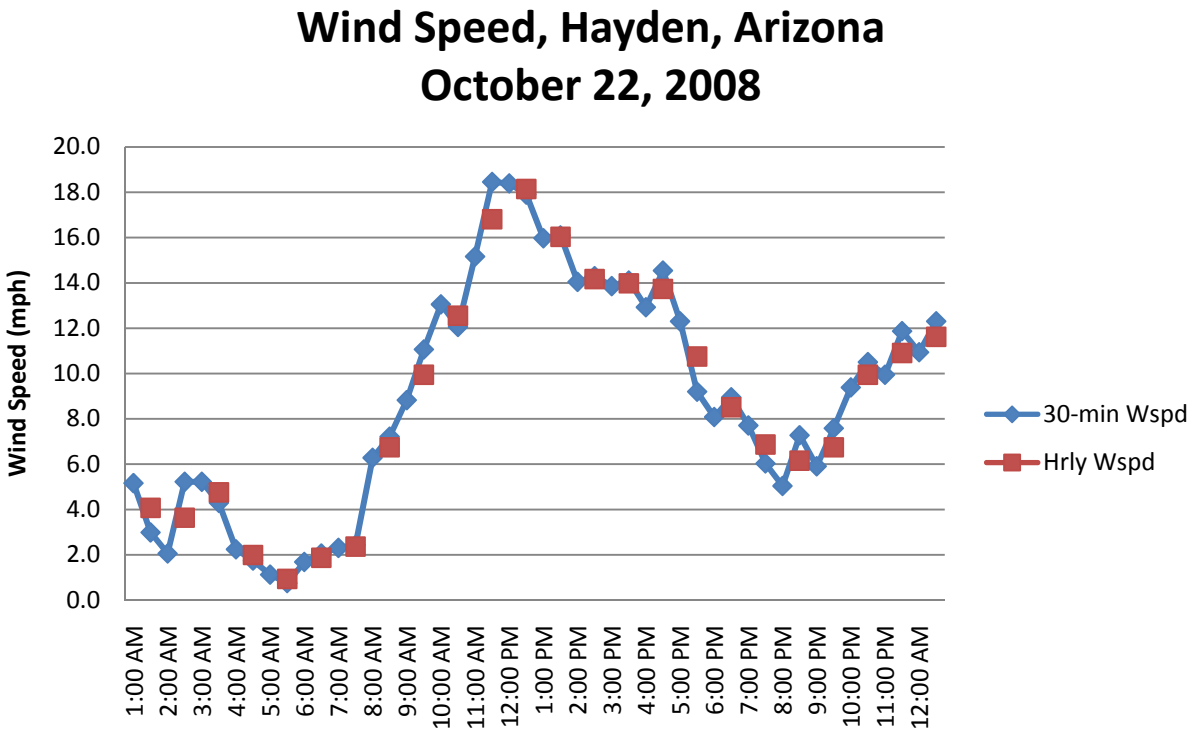


Figure 2-5
Hayden Monitor Average 30-Minute and Hourly Wind Speeds
October 22, 2008

2.1.2 Impact of Removing Exceptional Events

As mentioned above, 40 CFR 50.14(b) states that if a monitored value is deemed to be caused by an exceptional event that that value is not to be included in the determination of an exceedance of the NAAQS. Accordingly, the three NAAQS exceedances identified in Table 4-1 of the ADEQ's TSD were recalculated without the inclusion of data from the three days identified above. The revised results are presented below.

Table 2-1 Three-Month Rolling Average Lead Concentrations During Late 2008

Period	Three-Month Rolling Average Lead Concentration (µg/m^3)	
	Original[a]	Revised[b]
July-September 2008	0.172	0.096
August-October 2008	0.184	0.079
September-November 2008	0.152	0.047

a) Calculated with data as presented in TSD.
b) Calculated with data as presented in TSD, with the exception of data for August 5, September 30, and October 22 being removed.

As shown in the table above, the exclusion of data from these three days—days that according to ADEQ guidance have exceptional wind speeds—results in no lead concentrations greater than the NAAQS.

2.2 SUITABILITY OF MONITOR LOCATION

The Hayden monitor has been placed on the roof of the maintenance building at the Town of Hayden maintenance yard. The location of the maintenance yard is given in Figure 2-6, while Figure 2-7 shows the placement of the monitor on the roof.

Figure 2-6
Location of Hayden Maintenance Yard

Figure 2-7
View of Monitor on Roof of Town of Hayden Maintenance Building
(looking to the southeast)

Asarco spoke with Bob Larona, the Town of Hayden General Superintendent, to ascertain whether there are any activities that take place at the maintenance yard that could affect monitored lead concentrations at the roof of the maintenance building. Based on the conversation there are activities conducted at the yard that could affect lead concentrations at the roof. Those activities include soldering/welding (which could produce lead emissions) and vehicular traffic (which could disturb particulates on the ground in and around the maintenance building, leading to increased amounts of lead in the sampler). These activities occur throughout the week, not just for isolated periods.

Given the activities at the maintenance yard and the frequency of those activities, the potential exists for lead concentrations to be monitored at elevated levels that are not representative of the overall area or an appropriately sited source-oriented monitor. If the goal of the Hayden monitor is to support a designation, then an alternative location should be considered.

2.3 QUALITY ASSURANCE

40 CFR Part 58 Appendix A establishes quality assurance (QA) requirements for air monitoring data collected for State and Local Air Monitoring Stations (SLAMS) network, Special Purpose Monitoring (SPM), or for purposes of Prevention of Significant Deterioration (PSD) permitting. While the Hayden monitor apparently was not established under any of these programs—it was established pursuant to a remedial investigation in a CERCLA proceeding—the data gathered at the Hayden monitor must nonetheless meet the QA requirements of 40 CFR 58 Appendix A if they are to be used to define a nonattainment area.

ADEQ has not reviewed the QA procedures/information for the data it used to propose a nonattainment designation for lead

The QA requirements specified by 40 CFR 58 Appendix A are presented in Table 2-2.

Table 2-2 QA Requirements of 40 CFR 58 Appendix A

QA Requirement	Citation	Description
Quality System Requirements	40 CFR 58, Appendix A Section 2	Prescribes a means to manage quality of monitoring information; includes Quality Management Plan and Quality Assurance Project Plan
Measurement Quality Check Requirements	40 CFR 58, Appendix A Section 3	Prescribes requirements for performing measurement quality checks to assess data quality; includes quarterly audits of sampling system
Calculations for Data Quality Assessments	40 CFR 58, Appendix A Section 4	Prescribes calculations for assessing data quality; includes precision estimate, bias estimate, and flow rate calculation
Reporting Requirements	40 CFR 58, Appendix A Section 5	Prescribes reporting requirements for SLAMS and PSD monitoring

Appendix D of the TSD is labeled "ADEQ Memo Certifying Air Quality Data for the Hayden Area" and contains an internal ADEQ memo prepared on August 13, 2009 from Jon Midgley to

Ira Domsky. That memo states that "(i)nformation about quality assurance checks performed on the samplers is not available at this time."[4]

Zephyr, accordingly, has not been able to review the QA procedures applicable and QA information required to be generated for the Hayden monitor under 40 CFR Part 58 Appendix A. Without the procedures/information, Zephyr cannot determine whether the data meet the QA requirements, and neither can the ADEQ. The ADEQ should review the procedures and information required under 40 CFR Part 58 Appendix A for the monitor, before it makes a proposal to designate an area nonattainment based on data from the monitor.

2.4 DATA COMPLETENESS (VALIDATION OF THREE-MONTH MEANS)

Section 4.1 of the TSD briefly discusses the three consecutive three-month means that are greater than the lead NAAQS. The sampling dataset on which the three-month means assessment is based spans data collected at the Hayden monitor from November 2007 through November 2008. Table 2-3 gives the three-month means of interest.

Table 2-3 Three-month Means (Lead) Given in Table 4-1 of ADEQ Technical Support Document

3-month Period	3-month Mean (µg/m^3)
July, August, September 2008	0.172
August, September, October 2008	0.184
September, October, November 2008	0.152

According to 40 CFR 50, Appendix R Section 1(c), the design value upon which lead NAAQS compliance is based is selected, according to procedures specified in Appendix R, from among the valid three-month mean concentrations for the design value period. Validity of the three-month mean is determined following procedures given in 40 CFR 50, Appendix R Section 4(c).

According to 40 CFR 50, Appendix R Section 4(c)(i), "A 3-month parameter mean is considered valid (i.e., meets the completeness requirements) if the average capture rate of the three constituent monthly means (i.e., the 3-month data capture rate) is greater than or equal to 75 percent."

The first step in determining the validity of a three-month mean is to calculate the relevant monthly capture rates. According to 40 CFR 50, Appendix R Section 4(c)(i),

> *Monthly data capture rates (expressed as a percentage) are specifically calculated as the number of creditable samples for the month (including any make-up samples taken the subsequent month for missed samples in the month in question, and excluding any*

[4] Several requests apparently have been made to the EPA and its contractors for quality assurance documentation. Asarco has not yet received copies of any responses to those requests.

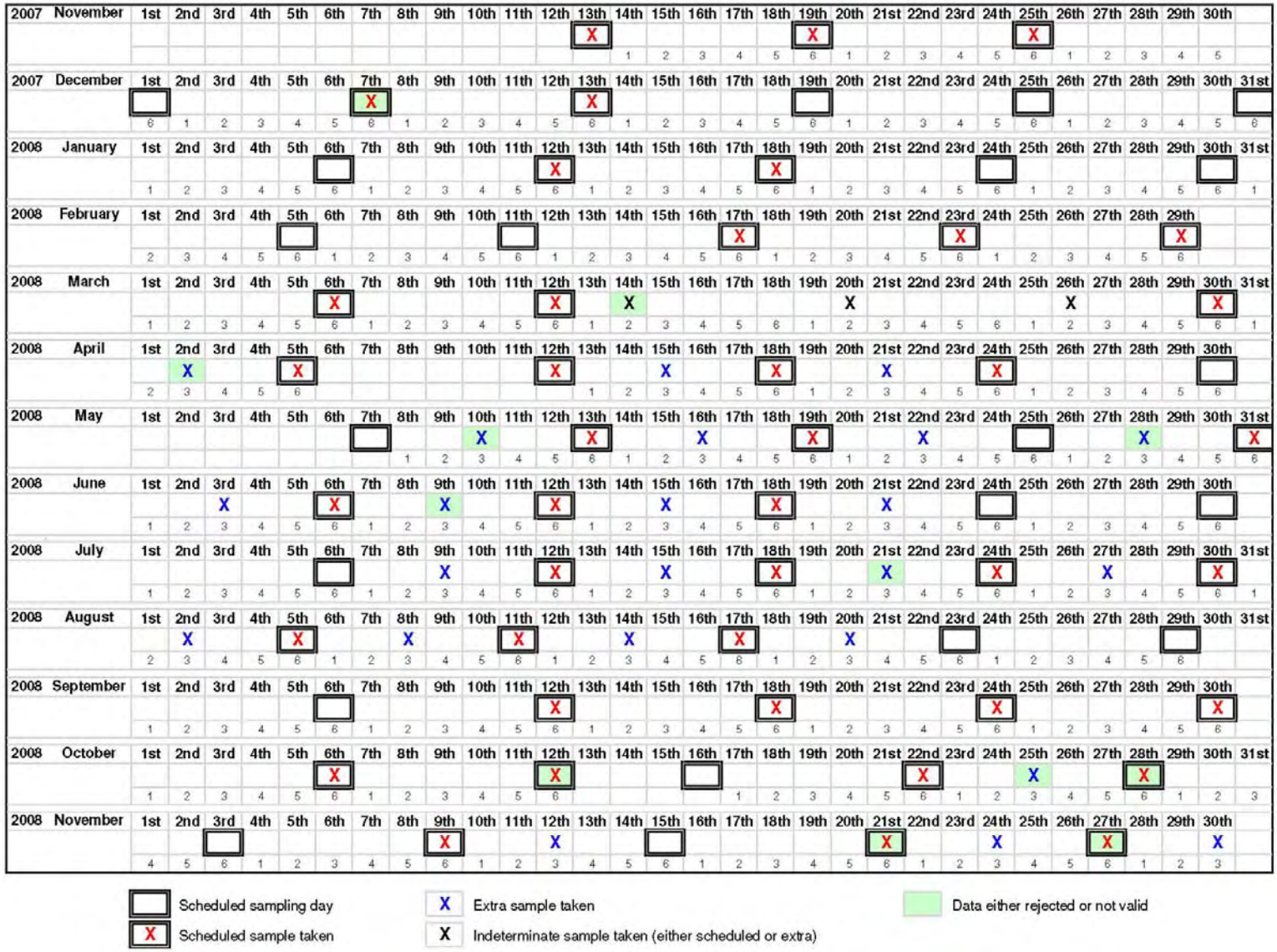
> *make-up samples taken in the month in question for missed samples in the previous month) divided by the number of scheduled samples for the month, the result then multiplied by 100 but not rounded.*

Creditable samples, according to 40 CFR 50, Appendix R Section 1(c), "…are samples that are given credit for data completeness. They include valid samples collected on required sampling days and valid 'make-up' samples taken for missed or invalidated samples on required sampling days."

To calculate the monthly data capture rate properly one must identify the *required sampling days* in order to identify creditable samples (the number of which is the numerator of the monthly capture rate) and to determine the number of scheduled samples (the denominator of the monthly capture rate). Required sampling days are equivalent to scheduled sampling days. According to 40 CFR 50, Appendix R Section 1(c), "Scheduled sampling day means a day on which sampling is scheduled based on the required sampling frequency for the monitoring site, as provided in section 58.12 of this chapter." 40 CFR 58.12(b) provides "For Pb manual methods, at least one 24-hour sample must be collected every 6 days except during periods or seasons exempted by the Regional Administrator." More importantly, 40 CFR 50, Appendix R confirms this scheduled sampling frequency by explicitly specifying the every sixth day frequency under Section 4(c)(i), that is, "For purposes of assessing data capture, Pb-TSP and Pb-PM_{10} data collected before January 1, 2009 will be treated with an assumed scheduled sampling frequency of every sixth day."

Since a specific list of scheduled sampling days was not available for the Hayden monitor, the scheduled sampling days were determined by examining the monitoring data collected at the Hayden monitor given in Appendix A of the TSD. Even though the focus of the validity assessment is the three consecutive three-month periods near the end of 2008 (including the months of July 2008 through November 2008, inclusive), Zephyr reviewed the entire monitoring record (November 13, 2007 to November 30, 2008) as provided to establish patterns in sampling and sampling frequency in order to identify scheduled sampling days. Table 2-4 is the result of this review. The table indicates determined scheduled sampling days (double-lined, bordered boxes). The table also indicates when monitored samples were collected. Specifically, the table indicates scheduled samples (red **X**'s) and extra samples (blue **X**'s). Sample indicators with a light green filled background correspond to collected samples that were invalidated or rejected by the monitoring contractor.

Table 2-4 Determined Scheduled Sample Days



The process of determining the scheduled sampling days was as follows (also, see Table 2-4). From the beginning of this dataset record through April 5, 2008 there is a clear, every sixth day sampling pattern based on the actual dates of sample collection. The only exception to this pattern is the three samples collected between March 14, 2008 and March 26, 2008, inclusive (see black **X**'s in Table 2-4). These three samples are collected every sixth day, but the sampling does not fall into the regular scheduled pattern. Note that the Technical Memorandum, which is Appendix A of the TSD, states that extra samples began to be collected (three days after the scheduled samples) after March 28, 2008. However, extra sampling three days after scheduled sampling was not apparent until April 2008. Then, around April 11/12, 2008 the actual sample collection seems to indicate a shift in sampling pattern, as the scheduled pattern moves ahead by one day. This "new" pattern continues into early May 2008 (around May 6/7, 2008 based on an extra sample collected on May 10, 2008) when the actual sample collection seems to indicate another shift in sampling pattern. Again, the scheduled pattern moves ahead by one day. This "new" pattern continues until the end of the dataset record. The only exception to this pattern is the samples collected in September 2008 through early October 2008 (through October 12, 2008). These samples are collected every sixth day but on a shifted schedule. However, because these samples are collected every sixth day with no extra samples collected (during a period when extra samples also are supposed to be collected three days after the scheduled sample), these actual samples are assumed to be collected on scheduled sampling days.

During the period of interest of July 2008 through November 2008, there are seven scheduled samples that are missing, and four scheduled samples that are invalid (i.e., rejected). In other words only 56% [(25-11)/25] of the scheduled samples are available during this period. The Technical Memorandum states that "…due to apparent power surging issues at the Hayden station, 13 samples (October through December 2008) were not collected." It goes on to state that "…the resulting data set is considered sizable enough for evaluation purposes in this TM." However, this is a subjective opinion and did not include a strict data validation following the procedures under 40 CFR 50, Appendix R Section 4(c).

40 CFR 50, Appendix R Section 4(c)(i) allows make-up samples to replace missed or invalidated required scheduled samples. However, the dataset record does not indicate any make-up samples were collected. Only extra samples are indicated. Extra samples, according to 40 CFR 50, Appendix R section 1(c), "…are non-creditable samples. They are daily values that do not occur on scheduled sampling days and that can not be used as 'make-up samples' for missed or invalidated scheduled samples." Therefore, the creditable samples are the valid, samples collected on the scheduled sampling days. Table 2-5 presents the number of creditable samples, the number of scheduled samples and the calculated monthly data capture rates (i.e., number of creditable samples divided by number of scheduled samples, multiplied by 100 but not rounded) for the months of July 2008 through November 2008.

Table 2-5 Creditable Samples, Scheduled Sampling Days and Capture Rates by Month

Month	No. of Creditable Samples	No. of Scheduled Samples	Capture Rate (%)
July 2008	4	5	80
August 2008	3	5	60
September 2008	4	5	80
October 2008	2	5	40
November 2008	1	5	20

Table 2-6 presents the three-month data capture rates for the time periods of interest.

Table 2-6 Three-Month Data Capture Rates by Time Period

Time Period	3-month Capture Rate (%)
July, August, September 2008	73
August, September, October 2008	60
September, October, November 2008	47

According to 40 CFR 50, Appendix R Section 4(c)(i), "The three-month data capture rate is the sum of the three corresponding unrounded monthly data capture rates divided by three (3) and the result rounded to the nearest integer (zero decimal places)." As an example, the calculated three-month data capture rate for the July, August, September 2008 period is 73% or [(80+60+80)/3]. Because the three-month data capture rates are less than 75%, the corresponding three-month lead means (see Table 2-3) are considered not valid (i.e., they do not meet the data completeness requirements of 40 CFR 50, Appendix R Section 4(c)(i).

The 3-month capture rates are below the 75% completeness threshold.

However, according to 40 CFR 50, Appendix R Section 4(c)(ii), "A 3-month parameter mean that does not have at least 75 percent data capture and thus is not considered valid under 4(c)(i) shall be considered valid (and complete) if it passes either of the two following 'data substitution' tests, one such test for validating an above NAAQS-level (i.e., violating) 3-month Pb-TSP or Pb-PM_{10} mean (using actual 'low' reported values from the same site at about the same time of the year (i.e., in the same month) looking across three or four years),…"

The three-month means of interest are above the NAAQS level. Therefore, the "data substitution" test of interest is the above NAAQS-level test. The above NAAQS-level test, according to 40 CFR 50, Appendix R Section 4(c)(ii), is as follows:

> *Data substitution will be done in each month of the 3-month period that has less than 75 percent data capture; monthly capture rates are temporarily rounded to integers (zero*

decimals) for this evaluation. If by substituting the lowest reported daily value for that month (year non-specific; e.g., for January) over the 38-month design value period in question for missing scheduled data in the deficient months (substituting only enough to meet the 75 percent data capture minimum), the computation yields a recalculated test 3-month parameter mean concentration above the level of the standard, then the 3-month period is deemed to have passed the diagnostic test and the level of the standard is deemed to be exceeded in that 3-month period.

Following the above NAAQS-level diagnostic test would require substitution of one missing sample in August 2008, two missing/invalid samples in October 2008 and five missing/invalid samples in November 2008. All reported monitoring data at the Hayden Monitoring Station (starting October 22, 2006) through the end of 2008 were reviewed to identify the lowest reported daily values for the months of interest. According to 40 CFR 50, Appendix R Section 4(c)(ii), "..substitution is permitted only if there are available data points from which to identify the high or low 3-year month-specific values, specifically if there are at least 10 data points from at least two of the three (or four for November and December) possible year-months." This criterion is met for the months of August and November, but not for the month of October. Only 7 data points from two of the three possible year-months (5 reported values in October 2007 and 2 reported values in October 2008) are available. Therefore, the substitution is not permitted for the month of October, and, thus, the diagnostic test cannot be performed for the August, September, October 2008 and September, October, November 2008 time periods. For these time periods the data completeness requirements (at least 75% data capture) are not met and the three-month means are considered not valid.

The data substitution diagnostic test was performed for the July, August, September 2008 time period. One missing scheduled data for August 2008 was substituted with the lowest reported value for the month of August. The lowest reported lead value for the month of August is 0.0142 µg/m^3 collected on August 6, 2007. The recalculated July, August, September 2008 test three-month mean is 0.166 µg/m^3 [(0.0718 + 0.1387 + 0.2884)/3]. This value is above the level of the lead standard, thus the three-month period is deemed to have passed the diagnostic test.

2.5 UNCERTAINTY REGARDING DESIGN VALUE

As defined in 40 CFR 50, Appendix R, the Design Value is the concentration "…that is compared to the NAAQS level to determine compliance; the design value for the Pb NAAQS is selected…from among the valid three-month (lead) arithmetic mean concentration(s)…" In practice it is the highest of the rolling three-month averages that are calculated.

The Design Value should be clearly defined before proposing to classify an area as nonattainment.

The TSD does not contain a discussion of the Design Value. A discussion of concentrations greater than the NAAQS is contained in Section 4.1 of the TSD; in that section it refers to Appendix A of the TSD

for more details pertaining to the monitoring results that confirm the Hayden area is in nonattainment for lead.

Appendix A of the TSD is labeled as "EPA's Air Quality Study of the Hayden Area," and consists of a Technical Memorandum prepared on December 31, 2008 from CH2M Hill to John Hillenbrand of EPA. The Technical Memorandum includes a summary of monitoring conducted at Hayden and provides tables of all monitoring results (pollutant and meteorological) on a daily basis (Table 1 in Appendix A of the TSD contains the Hayden information).

Following these detailed tables there is an individual page that presents a Design Value of 0.21 $\mu g/m^3$ for lead for the Hayden monitor for the period 2006-2008. However, there is no explanation as to the derivation of this value; furthermore, a close inspection reveals that the data presented in Appendix A of the TSD do not support the 0.21 $\mu g/m^3$ value.

Zephyr looked into this discrepancy further and ascertained that the Design Value of 0.21 $\mu g/m^3$ may be based on data provided in electronic format by John Hillenbrand of EPA to Jack Garrity of Asarco on September 23, 2009 (these data are presented in the spreadsheet in Appendix A of this report). It is not clear the spreadsheet data have been vetted for exceptional events, quality assurance and data completeness.

It is unclear, therefore, which, if any, dataset is appropriate to use. While the ADEQ apparently makes its proposal based on the data in Appendix A of the TSD, the TSD's sole actual reference to a Design Value may rely on a completely different set of data which may or may not have undergone validation under the rules. The ADEQ should clearly establish and validate the Design Value for comparison to the NAAQS. Without a clearly established and properly validated Design Value a designation of nonattainment is not justified.

APPENDIX A
HAYDEN AIR QUALITY MONITORING DATA
RECEIVED FROM EPA ON SEPTEMBER 23, 2009

Location	Sample Date	Units	Lead		
			Result	Qualifier	NAAQS
Hayden	10/22/06	µg/m^3	0.0024	*	0.15
Hayden	11/03/06	µg/m^3	0.0266		0.15
Hayden	11/09/06	µg/m^3	0.0141		0.15
Hayden	11/11/06	µg/m^3	0.044		0.15
Hayden	11/21/06	µg/m^3	0.5947		0.15
Hayden	11/27/06	µg/m^3	0.0191		0.15
Hayden	12/03/06	µg/m^3	0.1595		0.15
Hayden	12/09/06	µg/m^3			
Hayden	12/15/06	µg/m^3	0.0329	J	0.15
Hayden	12/21/06	µg/m^3	0.0027	*	0.15
Hayden	12/27/06	µg/m^3	0.0143		0.15
	Average		0.0834		

Hayden	01/08/07	µg/m^3	0.47		0.15
Hayden	01/14/07	µg/m^3	0.0167		0.15
Hayden	01/20/07	µg/m^3	0.0043		0.15
Hayden	01/26/07	µg/m^3	0.0099		0.15
Hayden	02/01/07	µg/m^3	0.005		0.15
Hayden	02/07/07	µg/m^3	0.0103		0.15
Hayden	02/13/07	µg/m^3	0.037		0.15
Hayden	02/19/07	µg/m^3	0.0173		0.15
Hayden	02/25/07	µg/m^3	0.0105		0.15
Hayden	03/03/07	µg/m^3	0.1444		0.15
Hayden	03/09/07	µg/m^3	R	R	0.15
Hayden	03/15/07	µg/m^3	0.032		0.15
Hayden	03/21/07	µg/m^3	0.0885		0.15
Hayden	03/27/07	µg/m^3	0.0227		0.15
Hayden	04/02/07	µg/m^3	0.028		0.15
Hayden	04/20/07	µg/m^3	0.0122		0.15
Hayden	04/26/07	µg/m^3	0.0324		0.15
Hayden	05/02/07	µg/m^3	R	R	0.15
Hayden	05/08/07	µg/m^3	0.0774		0.15
Hayden	05/14/07	µg/m^3	0.0257		0.15
Hayden	05/20/07	µg/m^3	0.0127		0.15
Hayden	05/26/07	µg/m^3	0.0253		0.15
Hayden	06/01/07	µg/m^3	0.046		0.15
Hayden	06/07/07	µg/m^3	0.0048		0.15
Hayden	06/13/07	µg/m^3	0.0238		0.15
Hayden	06/19/07	µg/m^3	0.0298		0.15
Hayden	06/25/07	µg/m^3	0.0299		0.15
Hayden	07/01/07	µg/m^3	0.0382		0.15
Hayden	07/07/07	µg/m^3	R	R	0.15
Hayden	07/13/07	µg/m^3	0.021		0.15
Hayden	07/19/07	µg/m^3	0.0986		0.15
Hayden	07/25/07	µg/m^3	0.0136		0.15
Hayden	07/31/07	µg/m^3	0.0208		0.15
Hayden	08/06/07	µg/m^3	0.0142		0.15

Location	Sample Date	Units	Lead		
			Result	Qualifier	NAAQS
Hayden	08/12/07	µg/m^3	0.0268		0.15
Hayden	08/18/07	µg/m^3	0.0429		0.15
Hayden	08/24/07	µg/m^3	0.0182		0.15
Hayden	08/30/07	µg/m^3	0.517		0.15
Hayden	09/05/07	µg/m^3	0.0294		0.15
Hayden	09/11/07	µg/m^3	0.8362		0.15
Hayden	09/17/07	µg/m^3	0.0803		0.15
Hayden	09/23/07	µg/m^3	0.0033		0.15
Hayden	09/29/07	µg/m^3	0.0273		0.15
Hayden	10/05/07	µg/m^3	0.0035		0.15
Hayden	10/11/07	µg/m^3	0.046		0.15
Hayden	10/17/07	µg/m^3	0.0194		0.15
Hayden	10/22/07	µg/m^3	0.5156		0.15
Hayden	10/27/07	µg/m^3	0.0242		0.15
Hayden	11/01/07	µg/m^3	0.0202		0.15
Hayden	11/07/07	µg/m^3	0.3183		0.15
Hayden	11/13/07	µg/m^3	0.0049		0.15
Hayden	11/19/07	µg/m^3	0.042		0.15
Hayden	11/25/07	µg/m^3	0.0538		0.15
Hayden	12/07/07	µg/m^3	0.2119		0.15
Hayden	12/13/07	µg/m^3	0.0944		0.15
	Average		0.0838		

Hayden	01/12/08	µg/m^3	0.1487		0.15
Hayden	01/18/08	µg/m^3	0.0613		0.15
Hayden	02/17/08	µg/m^3	0.0291		0.15
Hayden	02/23/08	µg/m^3	0.0081		0.15
Hayden	02/29/08	µg/m^3	0.0764		0.15
Hayden	03/06/08	µg/m^3	0.0697		0.15
Hayden	03/12/08	µg/m^3	R	R	0.15
Hayden	03/14/08	µg/m^3	0.064		0.15
Hayden	03/20/08	µg/m^3	0.0152		0.15
Hayden	03/26/08	µg/m^3	0.0125		0.15
Hayden	03/30/08	µg/m^3	0.0024	*	0.15
Hayden	04/05/08	µg/m^3	0.0305		0.15
Hayden	04/12/08	µg/m^3	0.4627		0.15
Hayden	04/15/08	µg/m^3	0.059		0.15
Hayden	04/18/08	µg/m^3	0.1272		0.15
Hayden	04/21/08	µg/m^3	0.0299		0.15
Hayden	04/24/08	µg/m^3	0.0097		0.15
Hayden	05/10/08	µg/m^3	0.022		0.15
Hayden	05/13/08	µg/m^3	0.1163		0.15
Hayden	05/16/08	µg/m^3	0.288		0.15
Hayden	05/19/08	µg/m^3	0.0236		0.15
Hayden	05/22/08	µg/m^3	0.0166		0.15
Hayden	05/28/08	µg/m^3	0.0361		0.15
Hayden	05/31/08	µg/m^3	0.028		0.15

Location	Sample Date	Units	Lead		
			Result	Qualifier	NAAQS
Hayden	06/03/08	µg/m^3	0.0547		0.15
Hayden	06/06/08	µg/m^3	0.0185		0.15
Hayden	06/09/08	µg/m^3	0.0843		0.15
Hayden	06/12/08	µg/m^3	0.0746		0.15
Hayden	06/15/08	µg/m^3	0.1255		0.15
Hayden	06/18/08	µg/m^3	0.033		0.15
Hayden	06/21/08	µg/m^3	0.1123		0.15
Hayden	07/09/08	µg/m^3	0.3432		0.15
Hayden	07/12/08	µg/m^3	0.0062		0.15
Hayden	07/15/08	µg/m^3	0.0191		0.15
Hayden	07/18/08	µg/m^3	0.047		0.15
Hayden	07/21/08	µg/m^3	0.0205		0.15
Hayden	07/24/08	µg/m^3	0.0731		0.15
Hayden	07/27/08	µg/m^3	0.0011		0.15
Hayden	07/30/08	µg/m^3	0.0132		0.15
Hayden	08/02/08	µg/m^3	0.0347		0.15
Hayden	08/05/08	µg/m^3	0.1629		0.15
Hayden	08/08/08	µg/m^3	0.457		0.15
Hayden	08/11/08	µg/m^3	0.0417		0.15
Hayden	08/14/08	µg/m^3	0.1646		0.15
Hayden	08/17/08	µg/m^3	0.1981		0.15
Hayden	08/20/08	µg/m^3	0.0363		0.15
Hayden	09/12/08	µg/m^3	0.0136		0.15
Hayden	09/18/08	µg/m^3	0.0462		0.15
Hayden	09/24/08	µg/m^3	0.1263		0.15
Hayden	09/30/08	µg/m^3	0.9676		0.15
Hayden	10/06/08	µg/m^3	0.02		0.15
Hayden	10/12/08	µg/m^3	0.0234		0.15
Hayden	10/22/08	µg/m^3	0.1968		0.15
Hayden	10/25/08	µg/m^3	0.042		0.15
Hayden	10/28/08	µg/m^3	0.3002		0.15
Hayden	11/09/08	µg/m^3	0.0887		0.15
Hayden	11/12/08	µg/m^3	0.0071		0.15
Hayden	11/21/08	µg/m^3	0.984		0.15
Hayden	11/24/08	µg/m^3	0.111		0.15
Hayden	11/27/08	µg/m^3	0.1731		0.15
Hayden	11/30/08	µg/m^3	0.0328		0.15
Hayden	12/06/08	µg/m^3	0.0113		0.15
Hayden	12/12/08	µg/m^3	0.1094		0.15
Hayden	12/15/08	µg/m^3	0.1166		0.15
Hayden	12/27/08	µg/m^3	0.0944		0.15
Hayden	12/30/08	µg/m^3	0.0115		0.15
	Average		0.1128		

Hayden	01/02/09	µg/m^3	0.0174		0.15
Hayden	01/19/09	µg/m^3	0.1583		0.15
Hayden	02/01/09	µg/m^3	0.1483		0.15

Location	Sample Date	Units	Lead		
			Result	Qualifier	NAAQS
Hayden	02/04/09	µg/m^3	0.9647		0.15
Hayden	02/06/09	µg/m^3	0.0433		0.15
Hayden	02/12/09	µg/m^3	0.0109		0.15
	02/18/09				
Hayden	02/20/09	µg/m^3	0.0567		0.15
	02/24/09				
Hayden	02/26/09	µg/m^3	0.1353		0.15
	03/02/09				
Hayden	03/04/09	µg/m^3	0.0253		0.15
	03/08/09				
Hayden	03/10/09	µg/m^3	0.1507		0.15
Hayden	03/13/09	µg/m^3	0.0706		0.15
	03/14/09				
Hayden	03/19/09	µg/m^3	0.0937		0.15
	03/20/09				
Hayden	03/26/09	µg/m^3	0.0807		0.15
Hayden	04/01/09	µg/m^3	0.1023		0.15
Hayden	04/07/09	µg/m^3	0.4633		0.15
Hayden	04/13/09	µg/m^3	0.0174		0.15
Hayden	04/19/09	µg/m^3	0.0455		0.15
Hayden	04/25/09	µg/m^3	0.0226		0.15
Hayden	05/01/09	µg/m^3	0.0645		0.15
Hayden	05/07/09	µg/m^3	0.0299		0.15
Hayden	05/13/09	µg/m^3	0.0913		0.15
Hayden	05/19/09	µg/m^3	0.0249		0.15
Hayden	05/25/09	µg/m^3	0.0050		0.15
Hayden	05/31/09	µg/m^3	0.0056		0.15
Hayden	06/06/09	µg/m^3	0.0040		0.15
Hayden	06/12/09	µg/m^3	0.0039		0.15
Hayden	06/18/09	µg/m^3	0.0083		0.15
Hayden	06/24/09	µg/m^3	0.0102		0.15

Average	0.1020
Maximum	0.9647

* = The result is less than three times the level of uncertainty.

J = Estimated value

NA = Not available

R = Rejected due to filter damage

Appendix G
ADEQ's Response to the Zephyr Report

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Response to ASARCO Consultant Zephyr Environmental Corporation Report
***Review of Arizona Department Of Environmental Quality's Technical Support Document for The Department's Proposed Boundary Recommendation for the 2008 Revision of the NAAQS for Lead* (November 10, 2009)**
December 9, 2009*

Zephyr Environmental Corporation (ZEC) raised the following issues regarding the technical basis of the recommended nonattainment area designation for the Hayden-Winkelman area:

" …

- Some of the monitored lead values relied upon in the TSD are associated with "exceptional events" under 40 CFR Part 50 and ADEQ guidance and should therefore not be counted toward determining whether the Hayden area is in nonattainment of the NAAQS for lead. When these "exceptional events" values are excluded there are no monitored values above the NAAQS.
- The Hayden monitor is located on top of the Town of Hayden maintenance building. Given the soldering/welding activities and vehicle traffic that take place at the maintenance yard, the potential exists for contamination of the samples obtained using the monitor.
- The Quality Assurance (QA) plan governing the Hayden monitor and the results of the various tests and calibrations required under the quality assurance rules governing ambient air monitors were not available at the time of Zephyr's review. As of the date of the TSD, the ADEQ had not reviewed information on the required quality assurance checks of the Hayden monitor, and it remains uncertain whether such checks occurred. This calls into question the validity of the data generated using the monitor.
- In support of the ADEQ's proposal, the TSD (at Table 4-1) compares 3-month means to the NAAQS. However, the TSD does not demonstrate the ADEQ validated the 3-month means according to 40 CFR Part 50, Appendix R Section 4(c) procedures. If these procedures were followed, it would be found that all the 3-month means above the lead NAAQS do not meet the specific 75% data completeness requirement.
- The Design Value (i.e., the single mean concentration that is required under the rules to be compared to the NAAQS to demonstrate attainment or nonattainment) was not clearly identified or adequately discussed in the TSD."

Each of these concerns will be addressed in turn.

<u>Exceptional Events</u>

ZEC prepared an analysis of rolling 3-month average wind speeds as part of the basis for claiming that the violations of the lead (Pb) National Ambient Air Quality Standard (NAAQS) were the results of exceptional events under the EPA exceptional events rule, 40 CFR 50.14. The claim is premised on an October 15, 2009, guidance document and analysis prepared by ADEQ to document "unusual winds" and their impact on ambient PM_{10} concentrations. In addition, they presented wind data for 3 different days where exceedances of the Pb NAAQS were measured and a generic assessment of the impact that wind has on hourly PM_{10} concentrations. While there may be some substance to their analysis, it was cursory and did not follow the requirements of either EPA rule or ADEQ's technical criteria for demonstrating that the wind events were the cause of the exceedances, were beyond normal historical fluctuations, and that the exceedances would not have occurred without the event (their paraphrasing of 40 CFR 50.14(c)(3)(iv)). Their argument revolves solely around the statement in the ADEQ document that "blowing dust can occur … with hourly averaged wind speeds that are above 10 miles per hour." These

* This document is the substantially the same as the December 3, 2009 version, excepting that minor revisions were made to pp. 7 and 8 in the Appendix.

demonstrations are inadequate to document and justify that the events were exceptional and should be excluded from the record for demonstrating compliance with the Pb NAAQS:

- The quotation from the ADEQ document was taken out of context with the full discussion of unusual winds with relation to blowing dust. While an hourly average of 10 mph is a demonstrated threshold for blowing dust, and also is unusual from the standpoint that it occurs less than 5% of the time, it is not necessarily an appropriate threshold for an exceptional event. ADEQ has and continues to base its demonstrations for exceptional events using maximum winds rather than hourly averages, unless it can be shown that the hourly average winds exceed 15 mph for 3 or more consecutive hours (See "Technical Criteria Document for Determination of Natural Exceptional Events For Particulate Matter Equal to or Less Than Ten Microns in Aerodynamic Diameter (PM10), May 31, 2000", available at www.azdeq.gov/environ/air/monitoring/monitor.html).
- PM_{10} and Pb 24-hour average concentrations for the three Pb exceedance days addressed by ZEC were reported as follows:

	PM_{10} Conc. ($\mu g/m^3$)	Pb Conc. ($\mu g/m^3$)
August 5, 2008	32.2	0.163
September 30, 2008	56.8	0.968
October 22, 2008	48.7	0.197

  Because these PM_{10} concentrations are well below the PM_{10} NAAQS of 150 $\mu g/m^3$, it does not appear that these Pb exceedances are associated with significant blowing dust.
- No causal relationship between the winds for these days and Pb concentrations was presented by ZEC.
- The ADEQ Technical Criteria Document for Assessment of Natural and Exceptional Events requires an analysis consisting of the following issues be prepared for an exceptional event demonstration:
    1. Properly qualify and validate the air quality measurement to be flagged.
    2. Review suspected contributing sources
    3. Examine all air quality monitoring information.
    4. Examine the meteorological conditions before and during the event
    5. Perform a qualitative attribution to emission source(s).
    6. Estimation of contribution from source or event.
    7. Determination that a natural or exceptional event contributed to an exceedance.
- In addition the requirement for an assessment report, the EPA Exceptional Events Rule requires that the demonstration also address the following specific components before concurrence by EPA can be expected:
    - There is a clear causal relationship between the event and the ambient concentration being flagged (40 CFR 51)
    - The event is associated with measured concentrations in excess of normal historical fluctuations, including background as required in 40 CFR 50.14(c)(3)(iii)(C)
    - There is a direct linkage between the measurements to be flagged and the event as required in 40 CFR 50.14(c)(3)(iii)(B)
    - There would have been no exceedances or violations but for the event as required in 40 CFR 50.14(c)(3)(iii)(D)
    - All appropriate State Implementation Plan (SIP) control measures were in place during the event, demonstrating that the event "is not reasonably controllable or preventable" as required in 40 CFR 50.1(j)
    - The event affects air quality as required in 40 CFR 50.1(j)

- The finalized document and any comments received were submitted to EPA to satisfy the requirements for public participation required in 40 CFR 50.14(c)(3)(i)
- The forecasts/advisories requirement was satisfied as described in 40 CFR 51.930(a)(1).

ADEQ has evaluated these claims more closely using all the criteria listed above and does not find that ambient lead measurements were affected by exceptional events on any of the days identified in the comments.

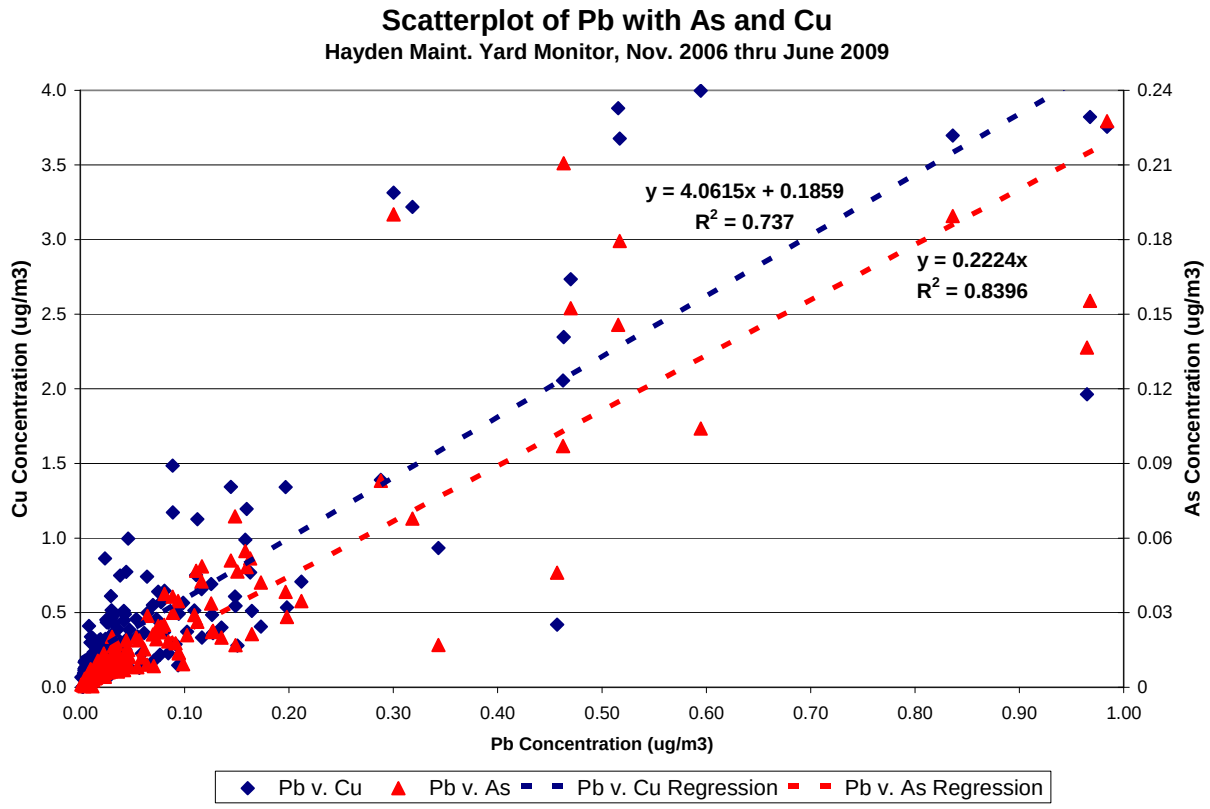
Suitability of Monitor Location

ZEC makes the claim that activities in and near the Town of Hayden Maintenance Yard are probable sources of Pb, either from welding and soldering at the Yard or from fugitive dust reintrained by traffic in and near the Yard. Two factors readily available in the data that ASARCO has had in their possession beginning in October 2007 countermand this claim:

- ZEC provides no documentation on the frequency or intensity of potential Pb emitting activities at or near the site.
- On only one day when the Pb NAAQS was exceeded does there appear to be evidence of a large amount of reintrained or windblown dust at this monitor. All but 5 of the 24 Pb exceedance days had PM_{10} concentrations greater than 50 $\mu g/m^3$, but on only one day was the PM_{10} concentration greater than 70 $\mu g/m^3$. On that one day, PM_{10} was barely above two-thirds of the NAAQS, at 100.3 $\mu g/m^3$. The PM_{10} NAAQS is set at a 24-hour average of 150 $\mu g/m^3$.
- Figure 1 (below) demonstrates there is a very strong correlation between Pb and both arsenic (As) and copper (Cu) concentrations. Neither of these elements are associated with welding and soldering, and all three elements – Pb, As and Cu – are associated with copper smelter operations.

Because the Maintenance Yard is in an area where the public has ready access and can breathe the air, it is very well suited to measure population exposure to air contaminants, including Pb.

Figure 1



Proper Quality Assurance Was not Verified by ADEQ

All ambient air monitoring was conducted following the EPA approved Quality Assurance Project Plan (QAPP) written by CH2M Hill in November 2005. The QAPP, "Final Quality Assurance Project Plan, Asarco LLC Hayden Plant Site, Remedial Investigation, Gila County, AZ", was amended in March 2009 when Innovative Technical Solutions, Inc. (ITSI) was assigned the project by EPA Region 9. ITSI also amended the Field Sampling Plan (FSP) written by CH2M Hill in November 2005. Since John Hillenbrand, the EPA Region 9 Superfund project officer, transmitted the data to Jack Garrity of ASARCO on a regular basis beginning in October 2007, ASARCO had ample opportunity to acquire the QAPP and all its revisions.

ADEQ did review the QAPP prior to making the decision to use these data for determining the attainment status of the Hayden area. The QAPP follows EPA guidelines contained in EPA Guidance for Quality Assurance Project Plans (EPA, 2002) and EPA Requirements for Quality Assurance Project Plans (EPA, 2001). Thus, the following section headings correlate with the subtitles found in the EPA guidelines (EPA, 2002). It contains the procedures to be followed for sample collection, analysis, and data management. All sample analysis was performed by the EPA Region 9 laboratory. All quality control checks on samplers followed EPA 40 CFR 58 requirements. Communication from the ITSI consultant indicates that all documentation (field checks, log books, and laboratory reports) were reviewed by either CH2M Hill (2006-Feb, 2009) or ITSI (Feb 2009 and continuing) during instrument operation and data validation, and will be posted on the consultant's FTP Website.

Specific descriptions of the air quality monitoring equipment and the required quality control checks are presented in Section 6 of the FSP. Air quality sampling at the two field locations began in November 2006.

The QAPP and FSP were in compliance with all EPA requirements, and personal communications with EPA staff and its contractors provided assurance that the procedures in the QAPP were strictly followed.

Further, EPA assessed the quality these data relative to compliance with the QAPP, FSP and their regulations, and concluded that the data were suitable for entry into the national data base.

At the request of the Governor's Office, elected officials and ASARCO, AQD staff conducted a detailed review of the QA/QC records for each data point for the July through November 2008 time period. Their conclusions are as follows:

1. A QAPP was submitted to EPA in November 2005, prior to the start of sampling in October 2006. This complies with the EPA requirement for air monitoring programs to have an approved QAPP prior to the start of sampling.
2. Addendums to the QAPP documents were made by the new consultant (ITSI) in March 2009.
3. Instrument checks were performed as described in the Field Sampling Plan. Copies of the checks are available from ITSI.
4. Laboratory reports contained chain of custody information, transmittal information, and laboratory quality control data along with the analytical results.
5. ADEQ's review of the above information concludes the lead data provided by Region 9 Superfund has experienced at least 3 levels of validation (sampler field checks and verification of sample validity immediately after collection, laboratory analysis and quality control checks of laboratory procedures) and review by EPA Superfund staff. These procedures are comparable to the procedures followed by ADEQ Air Assessment staff.
6. The preliminary report by CH2M Hill omitted several sample results that were included in the EPA spreadsheet. CH2M Hill footnotes do not indicate why those samples were omitted but do state that additional validation and QA/QC could change the results included in the report. ADEQ review of all the QA/QC documentation supports EPA's determination that the samples and the data generated from those samples were valid.
7. All violations of the 2008 Pb NAAQS calculated by ADEQ and included in the recommendation to designate the Hayden area as nonattainment are accurate and valid.

3-month Means and Design Values

The ADEQ TSD Table 4-1 lists three exceedances of the NAAQS in 2008 at the Hayden Town Maintenance Building. These averages were in the CH2M Hill report prepared for EPA in December 2008, "Preliminary Evaluation of PM10 and Metals Concentrations from October 2007 to December 2008 in ambient Air at the Hayden and Winkelman Monitoring Stations." The report includes an appendix of tables of all analytical results from the samples CH2M Hill considered valid. Samples are from the period November 13, 2007 through November 30, 2008. Footnote 28 of each table states, "This table should be considered preliminary and will be revised based on incoming data, final data validation and QA/QC."

Three-month Means and Design Values were calculated using the larger quality assured data set provided by the EPA Superfund project manager, John Hillenbrand, who also transmitted the same spreadsheets to Jack Garrity of ASARCO. These data include validated samples from October 22, 2006, through December 30, 2008. These data were reported to the EPA Air Quality System (AQS) by the September 1, 2009 deadline listed in the CFR. Since EPA owns the data, EPA Region 9 is listed as the Primary Quality Assurance Organization (PQAO), collecting agency, and analyzing agency. ADEQ is listed only as the reporting agency, which is a function that ADEQ performs in its regular course of business.

Design Values were calculated for both the Winkelman and Hayden sites from the October 22, 2006, through December 30, 2008, data and included in the 'Tables' appendix of the TSD. These values were calculated following 40 CFR 50 Appendix R requirements. Several 3-month periods had less than 75% data capture requiring data substitution tests to be performed as described in Appendix R Section 4(ii). The result of the data substitution test is a 'test mean' and is not considered the actual 3-month parameters mean and is not used in the calculation of the design value. It confirms the likelihood that the original mean (with less than 75% data capture) reflects the true over/under NAAQS status. ADEQ's calculations

and determinations regarding data capture and validity of averages are attached to this document, and will be included in the TSD.

- ZEC included the full EPA data set for Hayden (lead only) in the appendix of the document, but discussed only the CH2M Hill document and results in their report. CH2M Hill's report gave EPA an early look at the preliminary results of the field sampling. The validated data set from EPA includes samples that CH2M Hill rejected.
- ADEQ used the EPA dataset to perform the data capture and concentration calculations, thus resulting in some differences from the ZEC findings. However, ZEC does not show all calculations for the CH2M Hill data (i.e., all 3 month averages and data completeness statistics) and it is unclear whether or not they used the extra samples in their calculations. Even if the only 3-month average retained is the July-Aug-Sept 2008 average (as they maintain), our calculations show it has a concentration of 0.17 ug/m^3, meaning the monitor is in violation. ADEQ's method for calculating the averages for calendar year 2008 and using data substitution as outlined in 40 CFR 50 Appendix R may be found in Appendix A of this document.

<u>The Design Value Was not Adequately Discussed</u>

ADEQ agrees with the comment regarding this issue and will make corresponding changes to the TSD to include the full data set relied upon and a discussion of the design value and how it was derived.

Appendix A
3-Month Average Lead Concentration Calculations
For the Hayden Maintenance Yard Monitor for Calendar Year 2008

2008 Monthy/3-Month Summary – Pb-PM10 Standard Conditions

Invalid 3-month average due to data capture

Invalid 3-month average due to data capture and insufficient number of samples.

Month	No. of Possible Samples	No. of Creditable Samples	Monthly Data Capture (%)	No. of Extra Samples	Monthly Average Lead ($\mu g/m^3$)	3-Month Data Capture (%)	3-Month Average Lead ($\mu g/m^3$)
January #	5	2	40	0	0.1045	58	0.11
February ^	5	3	60	0	0.0377	44	0.10
March ^	5	4	80	0	0.0400	60	0.06
April ^	5	4	80	2	0.1193	73	0.07
May	5	5	100	2	0.0756	87	0.08
June	5	3	60	4	0.0714	80	0.09
July	5	5	100	3	0.0653	80	0.07
August ^	5	3	60	4	0.1560	73	0.10
September	5	4	80	0	0.2880	80	0.17
October ^^	5	4	80	1	0.1162	73	0.19
November ^^	5	3	60	3	0.2325	73	0.21
December #	5	4	80	1	0.0682	73	0.14

Valid 3-month average (may include data substitution).

^ Data Capture <75% and average is below the NAAQS, so data substitution is not allowed. As a result, this is not a valid 3-month average.

^^ Data Capture <75% and average is the above the NAAQS; 40 CFR 50 Appendix R § 4(c)(ii)(A) allows use of the LOWEST data value recorded in the same month over the design period as a substitute for the missing sample(s) up to minimum 75% data capture. This 3-month average is valid.

Data Capture <75% and number of samples for month in the design value period is insufficient; thus, data substitution not done and 3-month average is invalid.

Above the NAAQS test - February 2008

Month	No. of Possible Samples	No. of Creditable Samples	Monthly Data Capture (%)	No. of Extra Samples	Monthly Average Lead ($\mu g/m^3$)	3-Month Data Capture (%)	3-Month Average Lead ($\mu g/m^3$)
December ~	6	6	100	0	0.0522		
January ~	5	4	80	0	0.0543		
February	5	3	60	0	0.0377	80	0.05

~ December had 4 samples substituted with 0.002 $\mu g/m^3$ from 12/21/2006 and January had 2 samples substituted with 0.004 $\mu g/m^3$ from 1/20/2007 for 2006-2008 Design Value period to get the February 2008 Data Capture >75%.

Above the NAAQS test - March 2008

Month	No. of Possible Samples	No. of Creditable Samples	Monthly Data Capture (%)	No. of Extra Samples	Monthly Average Lead ($\mu g/m^3$)	3-Month Data Capture (%)	3-Month Average Lead ($\mu g/m^3$)
January ~	5	5	100	0	0.0442		
February	5	3	60	0	0.0377		
March	5	4	80	1	0.0400	80	0.04

~ January had 3 samples substituted with 0.004 $\mu g/m^3$ from 1/20/2007 for 2006-2008 Design Value period to get the March 2008 Data Capture >75%.

Revisions from December 3, 2009 version: Table footnote "^^" was revised to properly characterize the data substitution procedure. Actual dates of substitute sample values were added.

Above the NAAQS test - April 2008

Month	No. of Possible Samples	No. of Creditable Samples	Monthly Data Capture (%)	No. of Extra Samples	Monthly Average Lead (µg/m^3)	3-Month Data Capture (%)	3-Month Average Lead (µg/m^3)
February ~	5	4	80	0	0.0295		
March	5	4	80	1	0.0400		
April	5	4	80	2	0.1193	80	0.06

~ February had 1 sample substituted with 0.005 µg/m^3 from 2/1/2007 for 2006-2008 Design Value period to get the April 2008 Data Capture >75%.

Above the NAAQS test - August 2008

Month	No. of Possible Samples	No. of Creditable Samples	Monthly Data Capture (%)	No. of Extra Samples	Monthly Average Lead (µg/m^3)	3-Month Data Capture (%)	3-Month Average Lead (µg/m^3)
June ~	5	4	80	4	0.0630		
July	5	5	100	3	0.0653		
August	5	3	60	4	0.1560	80	0.09

~ June had 1 sample substituted with 0.004 µg/m^3 from 6/7/2007 for 2006-2008 Design Value period to get the August 2008 Data Capture >75%.

Above the NAAQS test - October 2008

Month	No. of Possible Samples	No. of Creditable Samples	Monthly Data Capture (%)	No. of Extra Samples	Monthly Average Lead (µg/m^3)	3-Month Data Capture (%)	3-Month Average Lead (µg/m^3)
August ~	5	4	80	4	0.1383		
September	5	4	80	0	0.2880		
October	5	4	80	1	0.1162	80	0.18

~ August had 1 sample substituted with 0.014 µg/m^3 from 8/6/2007 for 2006-2008 Design Value period to get the October 2008 Data Capture >75%.

Above the NAAQS test - November 2008

Month	No. of Possible Samples	No. of Creditable Samples	Monthly Data Capture (%)	No. of Extra Samples	Monthly Average Lead (µg/m^3)	3-Month Data Capture (%)	3-Month Average Lead (µg/m^3)
September	5	4	80	0	0.2880		
October	5	4	80	1	0.1162		
November ~	5	4	80	3	0.1999	80	0.20

~ November had 1 sample substituted with 0.004 µg/m^3 from 11/13/2007 for 2006-2008 Design Value period to get the November 2008 Data Capture >75%.

Revisions from the December 3, 2009 version: Actual dates of substitute sample values were added.

Appendix H
Town of Kearny Resolution Regarding Pb Boundary Recommendation

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TOWN OF KEARNY

BOX 639, KEARNY, AZ 85237

PHONE (520) 363-5547
FAX (520) 363-7527

December 1, 2009

Honorable Janice K. Brewer
Governor
State of Arizona
1700 West Washington, 9th Floor
Phoenix, AZ 85007

Dear Governor Brewer:

The Town of Kearny was notified on October 22, 2009 that a non-attainment air quality designation was being recommended by the Arizona Department of Environmental Quality (ADEQ) for lead particulates. The ADEQ report recommending the boundary of the non-attainment area includes the Town of Kearny.

The Federal Clean Air Act requires the U.S. Environmental Protection Agency (EPA) to establish ambient air quality standards throughout the nation. EPA reduced the air quality standard for lead by a factor of 10 from 1.5 micrograms per cubic meter to .15 micrograms this calendar year.

The non-attainment designation for Kearny is apparently based on a rolling three month average of readings collected last fall from monitors located in Hayden, which is 12 miles away. There is no air monitoring device located in Kearny, therefore no accurate air quality data for our community. Furthermore, the ADEQ Technical Support Document for the Boundary Recommendation, page 22, Table 4-3, emissions data, states "the density of Pb (lead) particles causes ambient emissions to settle near the emission source." The source of the lead air emissions is the ASARCO smelting operations, which is 12 miles from Kearny, and therefore the particles can not get to Kearny because of settlement near the source.

The Kearny Town Council has adopted the attached resolution which urges you to recommend to the EPA an unclassified air quality designation for Kearny as it relates to lead particulates. The non-attainment designation has potential detrimental effects on economic development and sustainability of the area.

Thank you for your consideration of our request. If I can provide additional information, please contact me.

Sincerely

Debra Sommers

Debra Sommers
Mayor

cc: Brian Davidson, ADEQ
Jack Garrity, ASARCO
Don Gabrielson, Pinal County

RESOLUTION NO 09-655

A RESOLUTION OF THE MAYOR AND TOWN COUNCIL OF THE TOWN OF KEARNY, ARIZONA, URGING THE GOVERNOR TO ESTABLISH AN UNCLASSIFIED AIR QUALITY DESIGNATION FOR LEAD PARTICULATES IN KEARNY

WHEREAS, the Federal Clean Air Act requires the U.S. Environmental Protection Agency to establish ambient air quality standards; and

WHEREAS, the Environmental Protection Agency has reduced the air quality standard for lead by a factor of 10; and

WHEREAS, the Arizona Department of Environmental Quality has proposed Kearny be located within a non-attainment air quality boundary for lead particulates based upon monitors located 12 miles from Kearny; and

WHEREAS, Zephyr Environmental Corporation has raised questionable issues in the technical support document underlying the Arizona Department of Environmental Quality's proposal; and

WHEREAS, the non-attainment air quality designation for lead particulates has potential detrimental effects on economic development and sustainability of the area.

NOW, THEREFORE BE IT RESOLVED by the Mayor and Town Council of the Town of Kearny, Arizona that:

1. The Governor recommends that the Town of Kearny be located in an unclassifiable designation for lead particulates.

PASSED AND ADOPTED by the Mayor and Town Council of the Town of Kearny, Arizona, this 23rd day of November, 2009.

Debra Sommers, Mayor

ATTEST:

Margaret Gaston, Town Clerk

APPROVED AS TO FORM:

Stephen R. Cooper, Town Attorney