

March 2, 2010  
Pima County Dept. of Environmental Quality  
150 W. Congress St.  
Tucson, AZ 85701-1317

Dear Mr. Grimaldi,

This report provides the particulate analysis results from three samples that PDEQ took in the vicinity of the ASARCO Mission Mine. The analysis was performed by the University of Arizona Center for Environmental Physics and Mineralogy. The complete report is attached and below is a summary of the results.

The three samples were analyzed in triplicate and this summary presents results related to PM2.5 (2.5 um in diameter) and PM10 (10 um in diameter) particulates. The numbers presented are the differential volume % which is related to the amount or mass of particles in the sample that are less than 2.5 um in diameter or less than 10 um in diameter.

Sample 21 is from the Mission Mine tailings dam  
Sample 66 is a desert soil background control  
RR Patio is tailings collected from a Rancho Resort community home patio

Particle diameter	Sample 21	Sample 66	RR Patio
	----- Differential volume % -----		
<2.5 um	13.50	8.61	11.97
<10 um	29.47	13.47	26.30

### Conclusion

It appears that there is twice the amount of < 10 um particles in the tailings and patio samples than in the background desert soil sample.

It appears that there is 1.5 times the amount of < 2.5 um particles in the tailings and patio samples than in the background soil sample.

Sincerely,



Raina M. Maier  
Professor and Associate Director, University of Arizona Superfund Research Program

# Center for Environmental Physics and Mineralogy

## Particle Size Analysis by laser diffraction, Instrument: Beckman Coulter LS 13 320

Analysis for: Pima County Department of Environmental Quality

Analysis Requestor: Pima County Department

Sample description: Mine Tailings

Samples ID's: 21-01, 66-01, RRPatio

Particle Diameter Range (µm)	USDA Size Class	21-01, 02, 03 (from Tailings Dam)					SE	USDA Size Class	66-01,02,03 (Background desert soil)					SE
		Rep. 1	Rep. 2	Rep. 3	Average	Differential Volume (%)			Rep. 1	Rep. 2	Rep. 3	Average	Differential Volume (%)	
< 2	Clay	12.10	12.10	11.80	<b>12.00</b>	0.10	Clay	8.48	8.06	7.51	<b>8.02</b>	0.28		
2 - 50	Silt	50.30	50.40	50.30	<b>50.33</b>	0.03	Silt	16.72	15.24	14.89	<b>15.62</b>	0.56		
50 - 2000	Sand	37.60	37.50	37.90	<b>37.67</b>	0.12	Sand	74.80	76.70	77.60	<b>76.37</b>	0.83		
2 - 5	F Silt	7.70	7.60	7.60	<b>7.63</b>	0.03	F Silt	2.92	2.74	2.59	<b>2.75</b>	0.10		
5 - 20	M Silt	22.10	22.00	22.10	<b>22.07</b>	0.03	M Silt	6.10	5.60	5.60	<b>5.77</b>	0.17		
20 - 50	C Silt	20.50	20.80	20.60	<b>20.63</b>	0.09	C Silt	7.70	6.90	6.70	<b>7.10</b>	0.31		
50 - 100	VF Sand	16.60	16.30	16.30	<b>16.40</b>	0.10	VF Sand	8.00	7.20	6.90	<b>7.37</b>	0.33		
100 - 250	F Sand	20.10	20.30	20.70	<b>20.37</b>	0.18	F Sand	15.70	13.80	13.60	<b>14.37</b>	0.67		
250 - 500	M Sand	0.90	0.90	0.90	<b>0.90</b>	0.00	M Sand	16.40	14.40	14.50	<b>15.10</b>	0.65		
500 - 1000	C Sand	0.00	0.00	0.00	<b>0.00</b>	0.00	C Sand	22.90	26.00	27.50	<b>25.47</b>	1.35		
1000 - 2000	VC Sand	0.00	0.00	0.00	<b>0.00</b>	0.00	VC Sand	11.80	15.30	15.10	<b>14.07</b>	1.13		
Textural Class:		<b>Silt Loam</b>					Textural Class:		<b>Sandy Loam</b>					
Mean Diameter (µm)		56.37					Mean Diameter (µm)		495.12					
% < 100 µm		78.73					% < 100 µm		31.00					
% < 10 µm		29.47					% < 10 µm		13.47					
% < 5 µm		19.63					% < 5 µm		10.77					
% < 2.5 µm		13.50					% < 2.5 µm		8.61					

of Environmental Quality

**RR Patio (Blown Tailings from Rancho Resort Patio)**

USDA Size Class	Differential Volume (%)			Average	SE
	Rep. 1	Rep. 2	Rep. 3		
<u>Clay</u>	10.80	10.50	10.40	<b>10.57</b>	0.12
<u>Silt</u>	47.40	47.10	47.30	<b>47.27</b>	0.09
<u>Sand</u>	41.80	42.40	42.30	<b>42.17</b>	0.19
F Silt	7.10	7.10	7.10	<b>7.10</b>	0.00
M Silt	18.80	18.60	18.70	<b>18.70</b>	0.06
C Silt	21.50	21.40	21.50	<b>21.47</b>	0.03
VF Sand	27.50	27.60	27.90	<b>27.67</b>	0.12
F Sand	14.30	14.80	14.40	<b>14.50</b>	0.15
M Sand	0.00	0.00	0.00	<b>0.00</b>	0.00
C Sand	0.00	0.00	0.00	<b>0.00</b>	0.00
VC Sand	0.00	0.00	0.00	<b>0.00</b>	0.00

Textural Class:	<b>Loam</b>
Mean Diameter (µm)	48.98
% < 100 µm	85.50
% < 10 µm	26.30
% < 5 µm	17.67
% < 2.5 µm	11.97

## Laser Diffraction Particle Size Profile

