

Confirmation Sampling Plan

Associated Information: Attachment 4A

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List the COCs and other parameters that will be sampled to confirm completion of the response action. Illustrate the monitoring or sampling locations in Attachment 4A. If monitoring or observation wells will be constructed for the response action, provide well construction details in Attachment 2B if not previously provided. If needed, describe the sample collection and handling methods, if not previously provided, in Appendix 6.

Media	COC ¹	Other parameter (specify)	Sampling Method	Sampling points ²	Depth/height (ft.)	Analytical Method	Sampling Frequency
Surface Soil Excavation Sites <u>East Property</u> Category I&II Areas Area 4 <u>Plant Site</u> Plant Entrance Storage Yard PCB Powerhouse West Plant Slope (to be included in Soil RACR) <u>PBA</u> PBA Channel/Cell 4 Area 12 <u>La Calavera</u> Fines Pile Removals North Cemetery <u>Floodplain</u> Lead Hot Spots East Sliver, Paisano (to be included in Soil RACR)	Arsenic		Grab	50-ft x 50-ft Grids at excavations	0-0.5 bgs	EPA Method 6010	One-time
	Cadmium		Grab	50-ft x 50-ft Grids at excavations	0-0.5 bgs	EPA Method 6010	One-time
	Cobalt		Grab	50-ft x 50-ft Grids at excavations	0-0.5 bgs	EPA Method 6010	One-time
	Copper		Grab	50-ft x 50-ft Grids at excavations	0-0.5 bgs	EPA Method 6010	One-time
	Lead		Grab	50-ft x 50-ft Grids at excavations	0-0.5 bgs	EPA Method 6010	One-time
	Mercury		Grab	50-ft x 50-ft Grids at excavations	0-0.5 bgs	EPA Method 7471A	One-time
	Molybdenum		Grab	50-ft x 50-ft Grids at excavations	0-0.5 bgs	EPA Method 6010	One-time
	Nickel		Grab	50-ft x 50-ft Grids at excavations	0-0.5 bgs	EPA Method 6010	One-time
	Selenium		Grab	50-ft x 50-ft Grids at excavations	0-0.5 bgs	EPA Method 6010	One-time
	Zinc		Grab	50-ft x 50-ft Grids at excavations	0-0.5 bgs	EPA Method 6010	One-time

¹ Specify either a specific COC or type of COC (such as VOCs, metals).

² Specify the sampling point to the degree it is known, (for example, MW-1, or near former boring #2).

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Groundwater (See Attachment 3A – Monitoring Plan for groundwater well locations)	Antimony		Grab	MW-9S, MW-11S, MW-2, EP-04, EP-06, EP-07, EP-112, EP-133, EP-128		EPA Method 6020	Semi-annual
	Arsenic		Grab	MW-9S, MW-11S, MW-2, EP-04, EP-06, EP-07, EP-112, EP-133, EP-128		EPA Method 6020	Semi-annual
	Cadmium		Grab	MW-9S, MW-11S, MW-2, EP-04, EP-06, EP-07, EP-112, EP-133, EP-128		EPA Method 6020	Semi-annual
	Chromium		Grab	MW-9S, MW-11S, MW-2, EP-04, EP-06, EP-07, EP-112, EP-133, EP-128		EPA Method 6020	Semi-annual
	Copper		Grab	MW-9S, MW-11S, MW-2, EP-04, EP-06, EP-07, EP-112, EP-133, EP-128		EPA Method 6020	Semi-annual
	Lead		Grab	MW-9S, MW-11S, MW-2, EP-04, EP-06, EP-07, EP-112, EP-133, EP-128		EPA Method 6020	Semi-annual
	Mercury		Grab	MW-9S, MW-11S, MW-2, EP-04, EP-06, EP-07, EP-112, EP-133, EP-128		EPA Method 7470A	Semi-annual

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Groundwater (See Attachment 3A – Monitoring Plan for groundwater well locations) (Continued)	Molybdenum		Grab	MW-9S, MW-11S, MW-2, EP-04, EP-06, EP-07, EP-112, EP-133, EP-128		EPA Method 6020	Semi-annual
	Nickel		Grab	MW-9S, MW-11S, MW-2, EP-04, EP-06, EP-07, EP-112, EP-133, EP-128		EPA Method 6020	Semi-annual
	Selenium		Grab	MW-9S, MW-11S, MW-2, EP-04, EP-06, EP-07, EP-112, EP-133, EP-128		EPA Method 6020	Semi-annual
	Thallium		Grab	MW-9S, MW-11S, MW-2, EP-04, EP-06, EP-07, EP-112, EP-133, EP-128		EPA Method 6020	Semi-annual
	Zinc		Grab	MW-9S, MW-11S, MW-2, EP-4, EP-06, EP-07, EP-112, EP-133, EP-128		EPA Method 6020	Semi-annual
	Chloride		Grab	MW-9S, MW-11S, MW-2, EP-4, EP-06, EP-07, EP-112, EP-133, EP-128		EPA Method E300	Semi-annual
	Fluoride		Grab	MW-9S, MW-11S, MW-2, EP-4, EP-06, EP-07, EP-112, EP-133, EP-128		EPA Method E300	Semi-annual

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Groundwater (See Attachment 3A – Monitoring Plan for groundwater well locations) (Continued)	Nitrate		Grab	MW-9S, MW-11S, MW-2, EP-4, EP-06, EP-07, EP-112, EP-133, EP-128		EPA Method E300	Semi-annual
	Sulfate		Grab	MW-9S, MW-11S, MW-2, EP-4, EP-06, EP-07, EP-112, EP-133, EP-128		EPA Method E300	Semi-annual
Surface water (See Attachment 3A – Monitoring Plan for surface water locations)	Arsenic		Grab	Rio Grande (SEP-1, SEP-2, SEP-4, SEP-9, SEP-10, SEP-11, SEP-12, SEP-13)		EPA Method 6020	Semi-annual
	Lead		Grab	Rio Grande (SEP-1, SEP-2, SEP-4, SEP-9, SEP-10, SEP-11, SEP-12, SEP-13)		EPA Method 6020	Semi-annual
	Selenium		Grab	Rio Grande (SEP-1, SEP-2, SEP-4, SEP-9, SEP-10, SEP-11, SEP-12, SEP-13)		EPA Method 6020	Semi-annual
	Chloride		Grab	Rio Grande (SEP-1, SEP-2, SEP-4, SEP-9, SEP-10, SEP-11, SEP-12, SEP-13)		EPA Method E300	Semi-annual
	Sulfate		Grab	Rio Grande (SEP-1, SEP-2, SEP-4, SEP-9, SEP-10, SEP-11, SEP-12, SEP-13)		EPA Method E300	Semi-annual

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Stormwater (See Attachment 3A – Monitoring Plan for stormwater locations)	Antimony		Grab	Outfalls (SW-2 through SW-8) and Gabions (SW-1a through SW-1d)		EPA Method 6020	Quarterly ¹
	Arsenic		Grab	Outfalls (SW-2 through SW-8); Gabions (SW-1a through SW-1d)		EPA Method 6020	Quarterly ¹
	Barium		Grab	Outfalls (SW-2 through SW-8); Gabions (SW-1a through SW-1d)		EPA Method 6020	Quarterly ¹
	Cadmium		Grab	Outfalls (SW-2 through SW-8) and Gabions (SW-1a through SW-1d)		EPA Method 6020	Quarterly ¹
	Chromium		Grab	Outfalls (SW-2 through SW-8) and Gabions (SW-1a through SW-1d)		EPA Method 6020	Quarterly ¹
	Copper		Grab	Outfalls (SW-2 through SW-8) and Gabions (SW-1a through SW-1d)		EPA Method 6020	Quarterly ¹

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Stormwater (See Attachment 3A – Monitoring Plan for stormwater locations) (Continued)	Lead		Grab	Outfalls (SW-2 through SW-8) and Gabions (SW-1a through SW-1d)		EPA Method 6020	Quarterly ¹
	Manganese		Grab	Outfalls (SW-2 through SW-8) and Gabions (SW-1a through SW-1d)		EPA Method 6020	Quarterly ¹
	Mercury		Grab	Outfalls (SW-2 through SW-8) and Gabions (SW-1a through SW-1d)		EPA Method 7470	Quarterly ¹
	Molybdenum		Grab	Outfalls (SW-2 through SW-8) and Gabions (SW-1a through SW-1d)		EPA Method 7470	Quarterly ¹
	Nickel		Grab	Outfalls (SW-2 through SW-8) and Gabions (SW-1a through SW-1d)		EPA Method 6020	Quarterly ¹
	Selenium		Grab	Outfalls (SW-2 through SW-8) and Gabions (SW-1a through SW-1d)		EPA Method 6020	Quarterly ¹
	Silver		Grab	Outfalls (SW-2 through SW-8) and Gabions (SW-1a through SW-1d)		EPA Method 6020	Quarterly ¹

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Stormwater (See Attachment 3A – Monitoring Plan for stormwater locations) (Continued)	Thallium		Grab	Outfalls (SW-2 through SW-8) and Gabions (SW-1a through SW-1d)		EPA Method 7470	Quarterly ¹
	Zinc		Grab	Outfalls (SW-2 through SW-8) and Gabions (SW-1a through SW-1d)		EPA Method 6020	Quarterly ¹

Note:

1 – Quarterly inspections of stormwater monitoring points will be conducted and documented. When qualifying rain events occur (≥ 0.5 inch), if appropriate sampling volume of stormwater has been captured in the automatic sampler(s), stormwater samples will be collected. If no rain event occurs during a given quarter, no inspection or sample collection will occur. Sampling at SW-2, SW-3, and SW-4 is contingent upon implementation of a compatible response action by the off-site property owner in coordination with TCT.

Explain the reasons for the above-listed sampling plan. Discuss statistical or geostatistical methodology(ies) which will be applied, if any, in the data collection process. Discuss any assumptions made in the statistical/geostatistical assessment, and how they will be met.

The confirmation program for the Former ASARCO Smelter Site is organized by media type including soil, groundwater, surface water, and stormwater run-off.

Confirmation of soil excavations will be performed by collection of soil samples on a 50-foot by 50-foot sampling grid of the excavated area. Soil samples will be analyzed for antimony, arsenic, cadmium, cobalt, copper, lead, mercury, molybdenum, nickel, selenium, silver, thallium, and zinc to demonstrate the critical PCLs have been met. Confirmation sample results will be compared directly to critical PCLs and calculated 95 percent upper confidence limits (95% UCL) using the following statistic: $95\% \text{ UCL} = \bar{x} + st/(n)^{1/2}$, where:

- \bar{x} = mean concentration of COC in confirmation soil samples
- s = standard deviation
- t = t-value from Student t tables at n-1 degrees of freedom.
- n = number of sample results

Maps indicating locations of sampling grids and tabular confirmation sample results will be presented in the Soil RACR including all removal areas.

The East Mountain AA meets the C/I PCLs based on calculation of 95% UCLs calculated by the EPA ProUCL Version 4.1 software as presented in **Appendix 7**. Individual concentrations of lead and arsenic exceeded C/I PCLs; however, 95% UCLs for these COCs are below the standard.

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Confirmation of the groundwater remedy will be monitored as presented in **Worksheet 3.1**. Groundwater treatment by the PRBs will be monitored using groundwater results from 18 of the monitoring wells as identified in **Table 3-1 of Attachment 3A**. A total of 6 wells will be monitored to evaluate WCUs including 3 up-gradient wells and 3 down-gradient wells. The PMZ monitoring program will include 21 wells being monitored for groundwater elevation to demonstrate gradient control is being achieved from the plant site cover system, channel liners, and the GHB system. Water quality associated with the PBA is monitored at 4 wells as AMPs down gradient from the PRBs. Additional wells will be monitored for water quality to demonstrate that covers are leading to general decreases in COCs levels beneath the covers including the plant site (individual monitoring networks for each of the South Terrace, Pond 1, Pond 5/6, Acid Plant, and PBA AAs), the Category II Material Storage Area, the Fines Pile, and the Boneyard. In all, 32 wells are identified in **Table 3-1** for evaluation of the covers' effectiveness at controlling impacts to on-site groundwater quality. Finally, MNA is being evaluated in the Floodplain AA to determine whether the remedy can ultimately achieve water quality goals at the alternate POE wells along Rio Grande. A total of 9 wells will be evaluated as alternate POEs with potential groundwater discharge to the river and 4 additional wells as AMPs. Groundwater discharge to the river will be evaluated using the statistical compliance spreadsheet presented as part of TCEQ guidance (RG-366, TRRP-15e).

Surface water confirmation monitoring will be conducted along with the groundwater monitoring program. Eight surface water sampling locations along the Rio Grande will be monitored twice annually. One set of samples will be collected during late winter in February or March, prior to opening flow on the river by IBWC from the Elephant Butte Reservoir. The second set of samples will be collected during months of flowing conditions on the river in August or September. Surface water samples will provide direct measure of the protectiveness of the remedy.

Stormwater confirmation sampling will be conducted in compliance with requirements of the stormwater discharge permit. Samples collected from discharges of 4 downstream gabion structures (SW-1a through SW-1d) will be combined in a weighted average concentration by scaling flow to the surface area of the individual drainage basin served by each downstream gabion as illustrated in **Figure 11**. Stormwater run-off from Basins 2, 3, 4, 5, and 6 flows south to stormwater outfall SW-1, located south of the plant site entrance. Stormwater from East Mountain AA basins north of Basin 6 flows north along I-10 drainage swales then discharges to the Upper PBA at the additional gabion and rip-rap check dam on the South Arroyo between the I-10 and UPRR rights-of-way as illustrated on **Figure 11**. Discharge from the gabion at Basin 12 discharges to the South Arroyo. Stormwater quality results from samples collected from gabions directed to SW-1 (Basins 2 through 6) will be evaluated based on area-weighted averages, while stormwater discharge from gabions flowing north will be qualitatively evaluated against stormwater benchmarks to evaluate the effectiveness of the gabions and the check dam and making operational adjustments. No stormwater sample is collected from Basin 5 due to the small size of the basin and safety issues with access to rugged terrain.