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ARCO WEST BUTTE SOILS PRELIMINARY SITE ASSESSMENT

SAMPLING AND ANALYSIS PLAN

October 13, 2004

INTRODUCTION

In a letter dated August 25th, 2004, from Atlantic Richfield Company (ARCO) to Butte-Silver Bow County (BSB), ARCO offered to donate portions of its land holdings west of Montana Tech to BSB. Approximately 560 acres is being offered. The property transfer is conditional of acceptance by BSB of certain covenants and obligations, which would include, but not be limited to, "performance of all (environmental) Response Actions and all Operations and Maintenance activities required on or in relation to the property."

The entire west Butte area has been designated as a separate Operable Unit (OU) by the U.S. Environmental Protection Agency (EPA) in the Silver Bow Creek / Butte Area National Priorities List (NPL) Site. According to a 2002 EPA document, the West Side Soils Operable Unit (WSSOU) encompasses areas of Silver Bow County that have experienced mining activity but lie outside the boundaries of the other Operable Units. The EPA has conducted very preliminary planning for performing a Remedial Investigation / Feasibility Study (RI/FS) for the WSSOU at some later date.

The BSB Council of Commissioners is currently considering ARCO's property offer. As part of their consideration, the Council has authorized the use of limited County funds to perform a preliminary site assessment on the subject properties. A Preliminary Site Assessment report is due to the Council by early to mid November 2004.

The purpose of this Sampling and Analysis Plan (SAP) is to document the procedures and protocols to be used in performing this Preliminary Site Assessment (PSA).

DISCLAIMER

It is important to recognize the very limited nature of this preliminary site assessment. In conducting a "full blown" Remedial Investigation, the EPA has extensive and very detailed sampling methodologies, including exacting requirements for Quality Assurance and Quality Control (QA/QC). The quality controls on sampling and analysis methodologies and QA/QC, are demanded by the EPA in anticipation of future litigation.

The purpose of this PSA is NOT to provide EPA quality data which will be suitable for inclusion in a subsequent EPA RI/FS or in defense of future litigation. The purpose of this PSA is to provide the Council with **an indication** of the environmental conditions which currently exist in the subject properties.

The data is to be used **only as an indication** of what conditions exist. Subsequent decisions on additional sampling, or potential remediation plans, or whether or not to accept ARCO's property offer, may require significant additional "Due Diligence" sampling and characterization efforts.

UNDEFINED PROPERTY BOUNDARIES

The subject properties are shown on the attached map (Fig. 1). Approximately 560 acres is being offered. As of October 13, 2004, ARCO personnel confirmed that the eastern boundary of the subject properties remains undefined. Likewise, ARCO has several properties located immediately north of the "Big Butte" (north of Oro Fino Gulch Road). ARCO personnel were uncertain if these properties were also to be included.

Similar property offers have been made separately to Montana Tech and to The World Museum of Mining. Similarly, the western boundaries of their property offers remain undefined. This critical piece of missing information must be recognized in assessing the results of the PSA.

Two West Butte ARCO properties (at least) have been specifically excluded from this PSA. The active Rock Screening Area, located west of Whiskey Gulch, north of the new walking trail and south of the Bluebird Trail has been eliminated because it is currently being used by ARCO to supply graded materials to the remaining portions of their Butte reclamation efforts. It is assumed ARCO will reclaim these disturbed properties upon completion of remedial actions. This assumption needs yet to be confirmed. Additionally, at least one "disturbed area" located immediately south of the new walking trail and east of whiskey Gulch will not be included because it has been recently reclaimed as part of the new walking trail remediation. Any other "disturbed areas" already reclaimed under Superfund will not be investigated.

PLAN OF ATTACK

The first course of action has been to seek out for review any existing data so that we don't unnecessarily duplicate data and to identify gaps in the data. The EPA has stated they have no soils data for the WSSOU. The State of Montana Department of Environmental Quality (DEQ) has stated the same. The EPA has, however, performed a preliminary survey of the visually disturbed areas and has provided that information to BSB electronically. ARCO has limited soils data, which they have agreed to provide but to date, we have not received it. We have also checked with the Montana Bureau of Mines and Geology (MBMG) for any existing soils, surface water and/or ground water data. This data continues to be researched.

Lacking any soils data, the "plan of attack" is now to gather field data from the subject properties. Montana Tech has graciously offered the services of their senior level Environmental Engineering Class to assist BSB in performing portions of this PSA. The plan is to utilize volunteer student labor to collect a representative number of samples, in a short amount of time, which are representative of the subject properties. These volunteers will greatly assist BSB in the performance of this PSA.

SAFETY
Personnel Safety is required at all times.
NO EXCEPTIONS.
All sampling personnel will be provided with a Safety Briefing prior to entering the field. Numerous safety and health issues will be discussed in detail. Without providing detail in this document, subjects will include;

- Vehicle safety;
- Utilization of "the Buddy System";
- Mine shafts and subsidence hazards;
- Tripping and falling hazards;
- Health hazards including Lead, Arsenic, Cadmium and fugitive dusts;
- Sample lifting and general work conditions;
- Personal hygiene and hand washing;
- Decontamination, and
- Precautions around gun shooters, if any.

Additionally, ARCO personnel have prepared a Property Access Agreement to be signed by each participant in the PSA.

SOILS SAMPLING

The EPA has performed a preliminary Global Positioning System (GPS) mapping exercise of the WSSOU, which has been provided to BSB. The EPA has mapped all (or most) of the "disturbed areas" in the WSSOU. This information is also shown on Figure 1. "Disturbed areas" do not necessarily indicate that any future remediation will be necessary, only that the area has been previously disturbed by mining.

The number of samples to be collected is limited by both time and money. Consequently, the sampling will be performed in two phases. Phase 1 will collect approximately 50 to 100 soil samples. Based upon the results of Phase 1 sampling, additional focused soil sampling will be targeted in Phase 2.

SOILS ANALYSIS
Several analytical methods and laboratories will be utilized to perform the analyses. The BSB Health Department has available an XRF device which uses X-Rays to accurately detect levels of lead and arsenic in soils. The BSB Lead Program has made this service available at minimum cost to the project. Additionally, a commercial laboratory (Ashe Analytical Services, Inc. of Butte) has also been retained to perform XRF analyses of the samples, which will include a suite of six metals (lead, arsenic, copper, cadmium, manganese and zinc). Mercury may be added to the suite for additional cost.

These six metals have been chosen for analysis because they are the primary Contaminants of Concern (COCs) used by the EPA throughout the Butte Priority Soils Operable Unit (BPSOU). Additional contaminants may be present which have not been included in this Preliminary Site Assessment.

All soil samples will be first analyzed by the BSB Health Department's XRF device (properly calibrated) for lead and arsenic. Subsequently, a number of the same samples will be delivered to Ashe Analytical for further analysis. Note that Ashe Analytical will utilize the exact same sample preparation and analytical methods as used by the EPA and ARCO for their Superfund work, including instrument calibrations, QA/QC, sample screening, sample drying and sample pulverization. Of the total anticipated samples (approx. 100), it is anticipated that approximately 50 will be delivered to Ashe Analytical. The remaining data will be used for comparative purposes to indicate whether or not additional sampling and/or analyses are needed.

INDIVIDUAL SAMPLE SIZE

The XRF analytical method requires very little volume of soil. Only approximately 100 grams of sample material is needed for an XRF analysis. It is therefore critical that samples be collected and composited which are as representative as possible of the given dump. Samples will be placed in a "zip-lock" plastic baggie and properly labeled. The total volume of any sample, composite or grab, needs only to fill approximately one half of the plastic baggie.

SAMPLING TEAMS

Sampling Teams, consisting of a minimum of two persons, will be assigned specific portions of the subject properties. Sampling teams will be supplied with sampling equipment (i.e., shovels, buckets, scoops, baggies, markers, etc.), detailed sampling protocols, and detailed topographic maps showing the precise areas to be sampled. The size and location of each "team area" will be dependent on the number of personnel available.

THE "BULLET" FACTOR

The entire west Butte area has been used extensively for many years for shooting sports. There are untold tons of lead bullets and lead shot widely distributed throughout the entire area. It is critical that lead bullets and lead shot not be allowed to contaminate a soil sample. Accordingly all dump and/or soil samples are to be taken at a **depth of 1 foot or more**, which should minimize the chance of contamination by particles of lead bullets and/or shot.

PHASE 1 DUMP SAMPLING PROTOCOLS

The subject properties are known to contain numerous areas previously disturbed by mining and/or mineral processing activities. However, the large majority of the area appears (visually) to be relatively undisturbed, containing many acres of sagebrush, shrubs, grasses and open space. This PSA will focus primarily on sampling and characterization of the visually disturbed areas, on the premise that any major sources of metals contamination will be associated with the numerous mine dumps. A few composite samples of the visually undisturbed areas will be collected and analyzed to determine some "background level" for comparison to the areas more heavily impacted by mining.

Recognizing that it is impossible and impractical to sample every square foot, multiple samples are to be collected, mixed and composited as a single sample, which may represent all or portions of a given mine dump. Several "Grab" samples will also be collected.

Given a "target dump", which may include a series of small dumps, the sampling team is initially to estimate the total number of samples required to characterize the target. The sampling team will then traverse the side-slope of the dump(s), collecting samples at predetermined intervals, such as walking paces. For example, collect a scoop sample (at 1 foot or more of depth), place a sampling flag to mark the location, then traverse the slope for 25 paces, and collect another scoop sample, then another scoop sample every 25 paces until the dump is entirely sampled or an adequate number of samples collected. As each individual scoop is collected, it is to be placed in a plastic bucket and the number of scoops recorded. The entire sample is then to be thoroughly mixed in the plastic bucket. After thorough mixing, the composited sample is to be placed in a "zip-lock" plastic baggie and properly labeled. Proper labeling is to include date, location, and whether the sample is a composite or a grab sample. Detailed maps are to be turned in by the sampling teams indicating the precise location of each sample.

MERCURY SAMPLING

The mineralogy of the west butte soils is known to be significantly different from the mineralogy of the mines on "the Butte Hill". The west Butte area was known to be a silver and manganese mining district. It is also known that numerous placer mining operations historically took place in the vicinity. Accordingly, several soil samples will be collected specifically targeting mercury as a potential contaminant. These samples will be collected in the bottoms of the existing drainages, such as Whiskey Gulch, which transects the subject property from north to south. The same sampling protocol will be used for these samples, i.e., composited scoops taken at a minimum of one foot in depth.

Depending on the availability of equipment, subsequent mercury sampling may be performed using a portable instrument, which measures mercury vapors. This device is known as a "mercury sniffer".

SURVEYING SAMPLE LOCATIONS

Depending on the availability of personnel, individual sample sites (flagged) will be surveyed via GPS and subsequently entered into the County's data base. This electronic mapping will allow future sampling efforts, if any, to attempt to duplicate and/or confirm our preliminary indications.

CHAIN OF CUSTODY

Chain of Custody protocols will NOT be implemented due to the preliminary characterization nature of this exercise. BSB staff will be at hand to collect all samples, verify the adequacy of labeling and mapping, and to assist in any unanticipated technical concerns or protocols. BSB personnel will deliver the samples to the BSB Health Department for the initial XRF analyses. BSB personnel will subsequently deliver selected samples to Ashe Analytical for further XRF analyses.

PHASE 2 DUMP SAMPLING

Additional Phase 2 sampling, if any, will be determined based on the results of the Phase 1 data. Any unusual or elevated data may warrant re-sampling for confirmation purposes.

SURFACE WATER SAMPLING

GROUND WATER SAMPLING

SUBSIDENCE

The entire west side soils area is known to contain several hundred mine shafts and exploration pits, known as "glory holes". These shafts are outside of the scope of Superfund actions because they are a safety hazard and not an environmental or human health problem specifically related to any "hazardous material".