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NAPL are present, or high levels of VOCs are detected using a field photoionization detector/~~flame ionization detector~~ (PID/FID), temporary wells will be installed to evaluate whether potentially recoverable NAPL, capable of flowing freely to a well, is present. If potentially recoverable NAPL is encountered, additional geoprobe holes will be pushed on an approximately twenty foot spacing to further define the extent of the contamination. It is estimated that two additional geoprobe holes will be needed; however, the actual number is dependent on the site conditions encountered and could be higher or lower. Additional geoprobe holes may also be added within the limits of the process waste tanks excavation.

Both subsurface soil samples and liquid samples will be collected as possible. Subsurface soil samples will be collected using Geoprobe push-type hydraulic equipment. Table 2 lists the projected number of samples to be collected, analyses, and sampling requirements. Sample containers will be provided by the Analytical Projects Office (APO).

Table 2. Analytical Sampling Requirements

Analysis Method	Number of Samples	Number of QC Samples	Total Number Samples	Containers, Preservatives, Holding Times
<u>Soils</u> SW846 Method 8260A	150	8 duplicate		120 ml wide mouth, Teflon lined, glass jar, 4° C, 14 days
Alpha Spectroscopy for Uranium 233/234, 234 & 238, Plutonium 239/240 and Americium 241	10	1 duplicate	169	250 ml glass jar, NA, 6 months
<u>Free Product/Groundwater</u> SW846 Method 8260A	10	1 duplicate 1 rinsate 5 trip blanks (1 per shipment)	17	Three 40 ml Teflon lined VOA vials per sample with septum lids, HCl* to pH < 2 and 4° C, 14 days

Note - For safety reasons, if there is any reason to believe the sample contains NAPL, acid will not be put into the sample jars, and contact between the sample and any form of acid will be avoided.

Core samples will be recovered continuously in two to five-foot increments and evaluated by a geologist familiar with the local stratigraphy. The geologist will determine the depth to bedrock. The geoprobe locations will be surveyed using Global Positioning System (GPS) equipment or other appropriate survey equipment so that data can be properly plotted.

3.2 Geoprobe Samples

All geoprobe boreholes will be advanced to a depth of two feet into weathered bedrock, or to a sufficient depth to confirm unweathered bedrock, a total depth expected not to exceed 30 feet. If refusal occurs prior to reaching bedrock, up to two offsets will be pushed to try and reach the sampling objectives. Geoprobe operations will be conducted as per GT.39 Push Subsurface Soil Sample.

Core samples will be collected continuously in two to five foot increments from the surface to approximately two feet into bedrock. These core samples will be monitored with a field instrument for the detection of low energy radiation (FIDLER), and in accordance with FO.15 Photoionization Detectors and Flame Ionization Detectors, visually inspected for signs of NAPL or other contaminant staining, and then visually logged by the field geologist per GT.01 Logging Alluvial and Bedrock Material. The depth and thickness of stained or saturated core will be described in detail; however, portions of Procedure GT.01 will not be used, e.g., sieving samples, investigation with a binocular microscope, and field estimates of plasticity.

Soil samples will be collected for analyses as described in Table 2 from every geoprobe hole to determine whether VOC source material is present in the subsurface soils. Samples will be collected for laboratory analysis of VOCs from every two foot interval, and will be collected where there are indications of contaminants, or from the base of the interval. If more than one discrete interval within a two-foot section shows sign of NAPL, then a sample will be taken from each interval. A radiological sample will be collected along with the first VOC sample which has indications of NAPL, or from the first interval of core collected at each location.

3.3 NAPL and Groundwater Samples

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9-11-97 If ~~PID/FID~~ readings, visible staining of the core, or the presence of NAPL on downhole tools indicate that NAPL is present, temporary wells will be installed. After the geoprobe holes are completed to the required depth, 1/2" to 3/4" internal diameter, Number 10 slotted, stainless steel screen sufficient to reach from the bedrock surface to one foot above the projected depth of NAPL will be joined using stainless steel collars to sufficient steel casing to reach 6 inches or more above the ground surface. The screened section will have a threaded or a riveted stainless steel cap on the

bottom. This assembly will be inserted into the hole to allow for collection of groundwater samples. 10/20 filter sand will be poured around the casing to cover at least one foot above the slotted screen. Granular bentonite will be poured into the annular space to ground surface to prevent cross contamination. A slip-over steel cap will be loosely affixed to the top of the well assembly. A one and one-half foot section of 1.5 inch interior diameter, schedule 40 PVC casing will be manually installed around the above ground section of the well and granular bentonite will be poured around the outside of the completed well assembly. A screw-on schedule 40 PVC cap will be attached to the 1.5 inch casing for additional protection.

Each temporary well will be checked within three days of completion. The water/NAPL level will be measured according to GW.01 Water Level Measurements in Wells and Piezometers, and if sufficient liquid exists for sample collection (estimated as at least one foot of standing liquid), a sample will be collected using the methods specified in GW.06 Groundwater Sampling. However, the well will not be purged prior to sample collection. If the recovered liquid separates into two distinct phases, the amount of each phase will be estimated, and a sample will be collected from each phase.

If the geoprobe hole is dry or contains less than one foot of liquid, a notation will be made in the field notebook. Those temporary wells that are dry or contain insufficient liquid for sampling will be revisited after one week has passed, liquid levels will be measured, and the well will be sampled if possible. After measuring the liquid level, the measuring device will be examined to determine whether the liquid was water or NAPL.

Temporary wells that are still dry or contain insufficient liquid for sampling after one week will be visited weekly or until the field project ends. If sufficient liquid exists prior to completion of the field project, liquid level measurements will be taken and a sample will be collected. All liquid level determinations will be noted in the project logbooks. At the end of the field project, these temporary liners will be left capped in case they can be used during or after installation of the collection system.

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If ~~PID~~PID/FID readings remain near background levels, if there is no indication of free liquid, and if the core does not show indications of staining, the geoprobe hole will be abandoned as per GT.05 Plugging and Abandonment of Boreholes.

RMRS, 1996b, *Final Revised Groundwater Conceptual Plan*, RF/ER-95-0121. UN.RMRS, 1997, *RMRS Quality Assurance Program Description*, RMRS-QAPD-001, Rev. 1, January.

7.0 LIST OF ACRONYMS

APO	Analytical Projects Office
DOE	Department of Energy
EPA	Environmental Protection Agency
ER	Environmental Restoration
FIDLER	Field instrument for the detection of low energy radiation
GPS	Global Positioning System
IHSS	Individual Hazardous Substance Site
NAPL	Nonaqueous Phase Liquid
OU	Operable Unit
PAM	Proposed Action Memorandum
PID/ PID/FID	Photoionization detector/ flame ionization detector
QA/QC	Quality Assurance/Quality Control
QAPD	Quality Assurance Program Description
RFCA	Rocky Flats Cleanup Agreement
RFETS	Rocky Flats Environmental Technology Site
RMRS	Rocky Mountain Remediation Services
SAP	Sampling and Analysis Plan
VOCs	Volatile organic compounds

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8.0 APPROVALS

_____ Date

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