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Weldon Spring Site Remedial Action Project

Weldon Spring Quarry Supplementary Environmental Monitoring Investigations Sampling Plan: Addendum 2

Revision 0

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Prepared by

MK-FERGUSON COMPANY
and
JACOBS ENGINEERING GROUP
7295 Highway 94 South
St. Charles, Missouri 63304

for the

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MK-FERGUSON
A MORRISON KNUDSEN COMPANY

Weldon Spring Site Remedial Action Project
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APPROVALS

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ES&H Manager — Date: 10/20/94

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1 INTRODUCTION

1.1 Purpose

The *Weldon Spring Quarry Supplementary Environmental Monitoring Investigations Sampling Plan*, (Ref. 1) included sampling locations and a list of parameters to be analyzed during the in situ groundwater sampling effort.

Phase I of the in situ groundwater sampling program was completed August 15, 1994. The initial results showed a strong stratification of uranium contamination that may require site-specific depths screening for extraction wells required for a treatability study. The planned treatability study is part of the Quarry Residual Operable Unit mission. During Phase I, the in situ water collection sampling technique was modified to include the use of temporal well points in areas where water inflow rates were too slow to obtain samples within a few hours.

The purpose of this addendum is to change the sample collection methodology north of the Femme Osage Slough, and to add new sampling locations and additional chemical parameters. This Phase II will also define the extent of the contamination.

1.2 Scope

The next in situ groundwater sampling phase will target the main uranium plume located north of the Femme Osage Slough around Vicinity Property 9 (VP 9). In addition, a limited number of samples will be taken in the Darst Bottoms where background water quality sampling showed stratification of the uranium concentration (Ref. 2).

2 SAMPLE LOCATION AND CHEMICAL CHARACTERIZATION

2.1 Location and Methodology

Up to 30 additional sample locations and up to 70 samples will be added to the area north of the Femme Osage Slough around VP 9. Most sampling locations will be along an east-west line on 50 ft spacings. The final number of sampling locations will depend upon the extent of the main plume and will be determined according to uranium analysis results. On-site uranium analysis will determine whether the boundary of the main plume has been reached and additional step-off sampling will be required. Some additional sampling may be required immediately south of the slough if the margins of the uranium plume cannot be determined north of the slough. In addition, background samples at three different depths will be collected in the Darst Bottoms area.

North of the slough, a 1 in. diameter polyvinyl chloride (PVC) well point will be temporarily installed at each sampling interval. In the fall and winter months, the groundwater level commonly is low; therefore, monthly groundwater sampling will continue until the spring of 1995 when groundwater rises. Monthly sampling will determine whether stratification of the uranium concentration corresponds with the change in groundwater level. The temporary well points will be removed after the first seasonal groundwater rise when associated sampling has been completed.

Samples will be collected south of the slough and in the Darst Bottoms area using the same mobile, reusable sampling tool used for sample collection during Phase I.

2.2 Analytes

The original sampling plan did not call for the analysis of nitroaromatic compounds, organic carbon, or certain redox couples. On-site and off-site analyses for the next phase will include:

Field Determinations:

- Temperature
- pH
- Eh
- Dissolved oxygen
- Specific conductance
- Color
- Clarity

On-Site Analysis:

- Uranium (total)
- Total organic carbon
- Ferric/ferrous iron
- Nitrate/nitrite
- Alkalinity

Off-Site Analysis:

- Nitroaromatic compounds
- Arsenic

Only water samples collected north of the slough will be analyzed for nitroaromatic compounds.

3 SAMPLE ANALYSIS AND DATA EVALUATION

Analytical results received from off-site laboratory analyses will undergo data verification as outlined in the original sampling plan and according to established site procedures. All field, on-site and off-site results will be tabulated, analyzed, correlated, and/or plotted on graphs, maps, and/or cross sections. These data will be combined with the data obtained from Phase I in situ groundwater sampling. A referenceable completion report including all analytical results and data analyses will be produced at the completion of the in situ groundwater sampling efforts.

4 REFERENCES

1. MK-Ferguson Company and Jacobs Engineering Group. *Weldon Spring Quarry Supplementary Environmental Monitoring Investigations Sampling Plan*, Rev. 0. DOE/OR/21548-264. Prepared for the U.S. Department of Energy, Oak Ridge Operations Office. St. Charles, MO. August 1992.§

2. Kleeschulte, Michael J. *Water-Quality Data for the Missouri River and Missouri River Alluvium Near Weldon Spring, St. Charles County, Missouri--1991-92*, U.S. Geological Survey, Open-File Report 93-109. Prepared in cooperation with the U.S. Department of Energy, Rolla, Missouri. 1993.§

PROCEDURES

ES&H 1.1.4, *Logbook Procedure*

ES&H 4.1.1, *Numbering System for Environmental Samples and Sample Locations*

ES&H 4.1.2, *Chain of Custody*

ES&H 4.1.4, *Quality Control Samples for Aqueous and Soil Matrices: Definitions, Identification Codes, and Collection Procedures*

ES&H 4.4.1, *Groundwater Sampling*

ES&H 4.4.4, *Subsurface Monitoring Device Plugging and Abandonment Procedure*

ES&H 4.5.1, *pH and Temperature Measurements in Water*

ES&H 4.5.6, *Measurement of Dissolved Oxygen in Water*

ES&H 4.9.1, *Environmental Monitoring Data Verification*

ES&H 4.9.2, *Environmental Monitoring Data Validation*

ES&H 4.9.3, *Data Review Procedure for Surface Water, Groundwater and Soils*