LMS/MND/S08951

Mound Operable Unit 1 Additional Volatile Organic Compound Investigation Work Plan

June 2012

U.S. DEPARTMENT OF ENERGY | Legacy Management

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Work Plan

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Abbreviations

DOE	U.S. Department of Energy
EPA	U.S. Environmental Protection Agency
MCL	maximum contaminant level
OU-1	Operable Unit 1
P&T	pump and treat
TCE	trichloroethene
VOC	volatile organic compound

1.0 Introduction

Elevated concentrations of volatile organic compounds (VOCs) are present in groundwater in the Operable Unit 1 (OU-1) area. Presently, VOC contaminated groundwater is being contained using two extraction wells to create a hydraulic barrier. A rebound study was performed from June 2011 through December 2011 to evaluate the changes in VOC concentrations in groundwater when the pump and treatment (P&T) system is not in operation. During the rebound study, it was determined that a discrete area of VOCs with concentrations greater than the U.S. Environmental Protection Agency (EPA) maximum contaminant levels (MCLs) was present in groundwater downgradient of the extraction wells. The source was unknown but was thought not to be residually contaminated soil beneath the former landfill. Samples from well 0451, which was installed in response to VOC concentrations that exceeded rebound study triggers, contained VOCs in concentrations that exceeded the MCLs. Prior to restarting the P&T system in December 2011, a large-scale Geoprobe campaign was performed to delineate VOC impact downgradient of the rebound study boundary.

Since the primary source of VOCs has been removed, the feasibility of moving away from containment to a more passive remedy, namely monitored natural attenuation, is being considered to address groundwater contamination in the OU-1 area.

1.1 Purpose

The purpose of this additional investigation is to identify possible sources or pathways of VOCs in groundwater that may be contributing to the elevated VOC levels measured near well 0451.

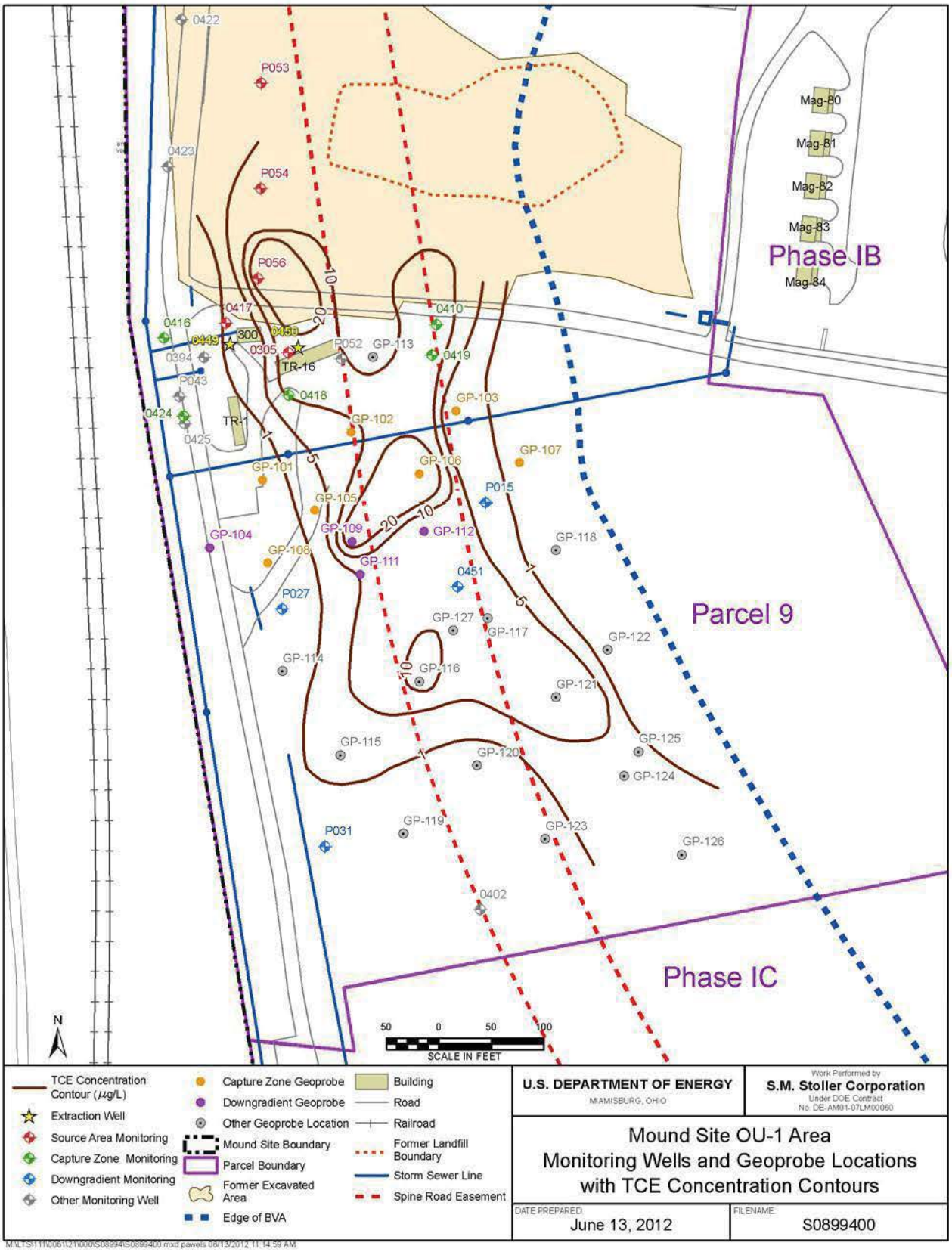
1.2 Objective

The objectives of the additional investigation are:

- Determine if VOCs in groundwater are the result of water being transmitted through a utility trench that traverses through the area upgradient of well 0451.
- Determine if groundwater seepage along a buried bedrock excavation face may be a source of VOCs.
- Determine if VOCs are present in a recently observed seepage downgradient of well 0451.
- Evaluate the changes in VOC concentrations downgradient of the extraction wells since restart of the P&T system in December 2011.

1.3 Background

Geoprobe sampling was performed periodically to evaluate the movement of VOC impacted groundwater south of the extraction well system during the rebound study (Figure 1). Ten locations were initially designated for the collection of groundwater samples using direct-push methods. Two additional locations (GP-111 and GP-112) were added to address the area between wells P015 and P027. A new well, designated 0451, was installed in September 2011 at the GP-110 location. Before the P&T system was restarted, a large-scale Geoprobe campaign was performed to determine the areal extent of VOCs in the OU-1 area. This sampling was performed on December 1 and 2, 2011, and included an additional 12 sample locations downgradient of well 0451. Locations GP-122 and GP-125 were offset to the west due to Geoprobe refusal above



Note: µg/L = micrograms per liter; BVA = Buried Valley Aquifer

Figure 1. TCE Distribution December 2011

the water table. Attempts to collect a sample at GP-107 also resulted in probe refusal above the water table, and no sample was collected at that location.

Data collected in December 2011 from the wells and Geoprobe locations were used to evaluate the distribution of trichloroethene (TCE) in the groundwater (Figure 1). The distribution indicated that the areas of higher impact continued to be present beneath the former landfill and in the vicinity of wells 0410 and 0419. Significantly elevated concentrations of TCE were measured in GP-106 and GP-109 and extended to well 0451. An isolated area of impact greater than the MCL was measured in GP-116. The source of TCE near well 0451 does not appear to be the residually impacted soil located in the southwestern corner of the landfill.

The Mound Groundwater Technical Team performed an extensive review of all the available information and data regarding VOC occurrence in the OU-1 area and areas to the north and east that may have a hydraulic connection to the OU-1 area. This review was performed to prepare a recommendation to address the elevated VOC concentrations discovered during the rebound study. The historical and verification data did not indicate any large areas of VOC impact or concentrations that could constitute a significant source to groundwater in the OU-1 area. Based on a review of these data and historical documents, the investigation will focus on the areas outlined in Section 2.

2.0 Sampling Approach

Four areas will be evaluated under this plan to define the source of VOCs detected in well 0451 and the extent of impact downgradient of this well. Sampling locations will be chosen with the objective of determining possible sources of or migration pathways for VOC impacted groundwater. Also, this study will evaluate changes in VOC concentrations downgradient of well 0451 since the P&T system restarted in December 2011.

The four areas included in this investigation are:

- Utility trench immediately upgradient of well 0451.
- Buried excavation face of the historical gravel pit along the eastern boundary of the OU-1 landfill.
- Wet area observed between well 0451 and GP-116.
- Groundwater downgradient of well 0451

2.1 Sampling Locations

A combination of groundwater sampling and soil gas sampling will be used to determined potential sources of VOCs at and downgradient of well 0451 (Figure 2). Also, the routine monthly sampling performed in the OU-1 area will be coordinated to occur during the same period as the groundwater sampling outlined in this plan. The monthly data will supplement data collected for the VOC investigation.

2.2 Soil Gas Sampling Locations

Soil gas samples will be collected at 17 locations along the utility trench and the buried excavation face, and within the wet area south of well 0451. Samples are spaced on approximately 50-foot (ft) intervals along these features. Locations may be offset in the field because of ongoing construction activities in the OU-1 area. All offsets greater than 5 ft must be approved by the lead hydrogeologist. Sample collection will start at a depth of 5 ft below ground surface and continue at 4 to 5 ft intervals to the top of the water table, resulting in collection of approximately five samples per location.

Additional soil gas samples may be collected if results of the field analyses indicate that a VOC source is present in this area. No additional sampling will be performed without permission of the operations manager and the lead hydrogeologist.

2.3 Groundwater Sampling Locations

Groundwater samples will be collected from the seven locations along the buried excavation face in OU-1. Sample collection will start at the top of the water table and continue at 4 ft intervals to the top of bedrock (as indicated by sampler refusal), resulting in the collection of approximately three samples per location.

Sixteen locations are designated for the collection of groundwater samples using direct-push methods. These include 15 previously sampled Geoprobe locations and one location in a recently identified wet area south of well 0451. One sample will be collected from each location. Locations may be offset in the field due to ongoing construction activities in the OU-1 area. All offsets greater than 5 ft must be approved by the lead hydrogeologist. A comparison of the depth to the glacial outwash in nearby wells to groundwater elevations indicates that the groundwater only occurs in the outwash. This is the portion of the aquifer that will be targeted, since the majority of groundwater movement occurs in the more permeable units. It is proposed that the sampler be pushed to a depth that will result in the sample being collected from the same interval as the screened interval in nearby wells.

The 10 remaining Geoprobe locations that were previously sampled in December 2011 will be sampled to provide DOE with a complete coverage of the OU-1 area to evaluate the distribution of VOCs in groundwater. These samples will be collected in the same intervals as samples from the previous sampling event. This information will supplement the body of data being collected to evaluate whether monitored natural attenuation can still be considered a viable alternative for contaminated groundwater in the OU-1 area.

2.4 Sampling Methods

Samples will be collected using the following equipment:

- Soil gas samples will be collected using a post-run tubing. sampler.
- Groundwater samples will be collected using a screen point sampler.

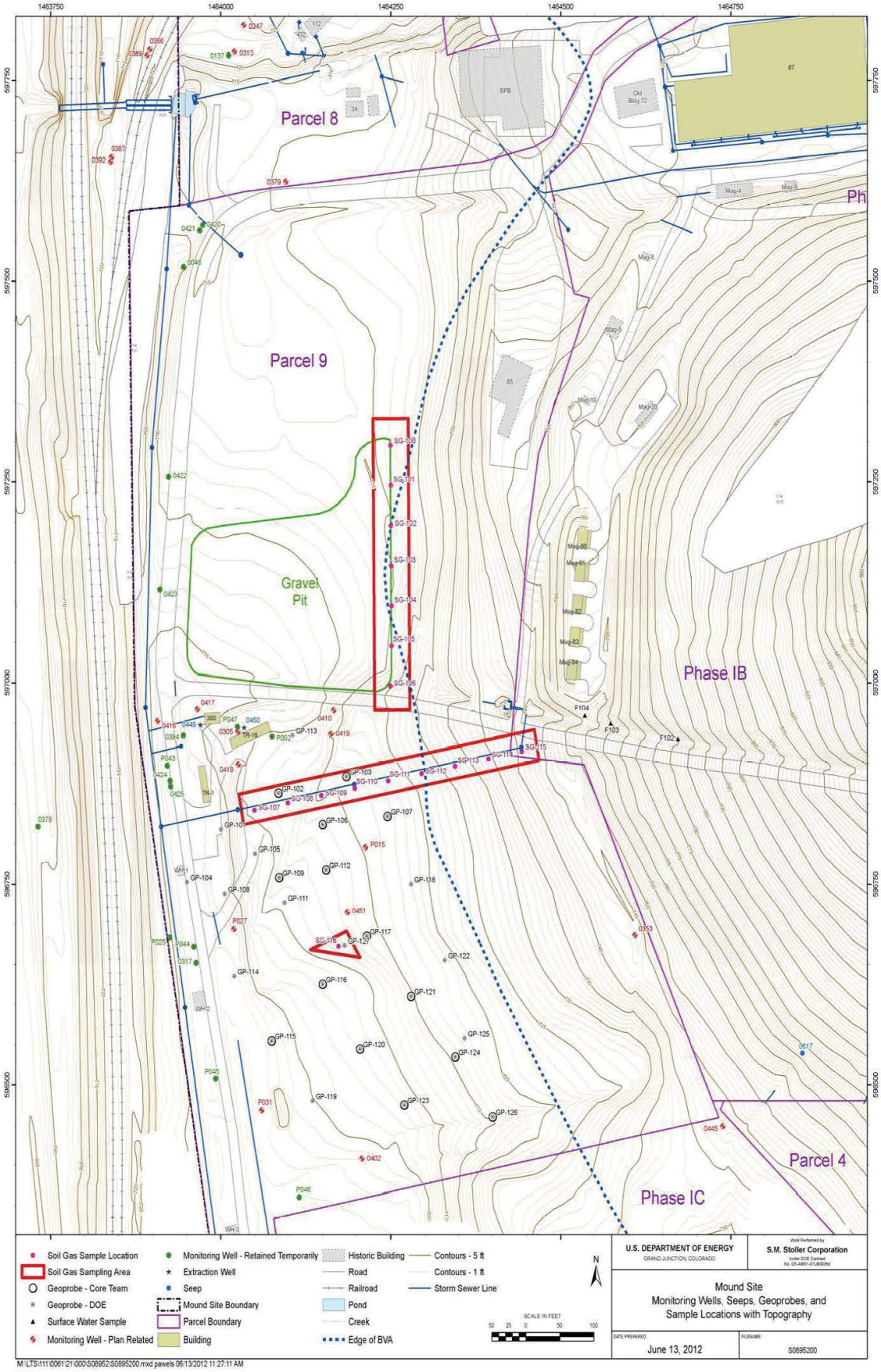


Figure 2. VOC Investigation Areas and Sampling Locations

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Equivalent methods may be used with prior approval of the project lead. Sampling will be performed in accordance with the methods outlined by the equipment manufacturer and applicable American Society for Testing and Materials methods

2.5 Analytical Methods

This investigation will focus on the presence of VOCs in both soil gas and groundwater. Soil gas samples will be analyzed qualitatively onsite to identify VOCs in soil above the water table. The qualitative results will be used to expand the sampling grid to delineate a potential source, if one is indicated. Groundwater samples will be collected for analysis at an offsite contract laboratory. Analytical methods will have detection limits less than the MCLs for each VOC of interest. Samples will be analyzed using the following methods:

- Groundwater: EPA Method 8260B, Target Compound List, Low Level
- Soil Gas: EPA Method 8260

3.0 Data Evaluation

Data from this additional investigation will be used to determine whether the VOCs detected near well 0451 are the result of:

- A residual VOC soil source near well 0451.
- A previously unknown contribution of VOC contaminated water entering the groundwater near well 0451 along the utility corridor north of this well.
- A previously unknown contribution of VOC contaminated water entering the groundwater along the eastern side of the landfill and bypassing the OU-1 P&T capture zone.
- A pulse of VOC contaminated groundwater from the OU-1 landfill that was detected in GP-106, GP-109, GP-116, and well 0451.

Data from the Geoprobe locations and wells will also be used to determine the distribution of VOCs in the groundwater since the OU-1 P&T system was restarted in December 2011. These data will also supplement a larger body of data being assembled to enable the Core Team to determine the appropriate action.

4.0 Reporting

Analytical results from this additional VOC investigation will be documented in the OU-1 P&T performance monitoring section of the Environmental Restoration Monthly report.

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Stoller

established 1959

Task Order LM00-712
Control Number 12-0701

June 18, 2012

U.S. Department of Energy
Office of Legacy Management
ATTN: Gwen Hooten
Acting Site Manager
10995 Hamilton-Cleves Hwy.
Harrison, OH 45030-9728

SUBJECT: Contract No. DE-AM01-07000LM00060, S.M. Stoller Corporation (Stoller)
Mound Operational Unit 1 Additional Volatile Organic Compound (VOC)
Investigation Work Plan

REFERENCE: LM00-712.06.508 Mound Support

Dear Ms. Hooten:

Enclosed is the *Mound Operational Unit 1 Additional Volatile Organic Compound Investigation Work Plan* dated June 2012. This plan will be used perform additional testing in the Operational Unit -1 area in an attempt to identify possible sources or pathways of VOCs in groundwater that may be contributing to elevated VOC levels measured near well 0451.

This plan requires approval from the Core Team so that these investigations can go forward. The work plan file will be sent electronically.

These documents are to be sent to Tim Fischer, U.S. Environmental Protection Agency and Brian Nickel, Ohio Environmental Protection Agency.

Please call me at (513) 648-3894 if you have any questions regarding this work plan.

Sincerely,

Greg Lupton FOR W. HERTEL

William A. Hertel
Stoller Site Manager

WAH/jp

cc: (electronic)
Jane Powell, DOE
Karen Reed, DOE
Rebecca Cato, Stoller

Charles Friedman, Stoller
Bill Hertel, Stoller
Greg Lupton, Stoller
Robert Ransbottom, Stoller
MND 030.02(A)
rc-mound

Department of Energy
Washington, DC 20585

June 20, 2012

Mr. Tim Fischer
U.S. Environmental Protection Agency
Region 5 (SR-6J)
77 W. Jackson Blvd.
Chicago, Illinois 60604

Mr. Brian Nickel
Remedial Project Manager
Ohio Environmental Protection Agency
401 East 5th Street
Dayton, OH 45402-2911

Dear Mr. Fischer and Mr. Nickel:

Subject: **Mound Operational Unit 1 Additional Volatile Organic Compound (VOC) Investigation Work Plan**

Enclosed is the *Mound Operational Unit 1 Additional Volatile Organic Compound Investigation Work Plan* for your review. This plan will be used to perform additional testing in the Operational Unit -1 area in an attempt to identify possible sources or pathways of VOCs in groundwater that may be contributing to elevated VOC levels measured near well 0451.

Please provide your approval at your earliest convenience.

If you have any questions or require additional information please call me at (720) 880-4349. Any correspondence should be addressed to:

U.S. Department of Energy
Office of Legacy Management
10995 Hamilton-Cleves Hwy.
Harrison, OH 45030

Sincerely,

Gwendolyn Hooten
Mound Site Manager
DOE-LM-20.2

Enclosure

cc (electronic - w/o enclosure)
J. Powell, DOE
K. Reed, DOE
R. Cato, Stoller
C. Friedman,.Stoller
B. Hertel, Stoller
G. Lupton, Stoller
J. Massie, JGMS
R. Ransbottom, Stoller

Massie, Joyce (CONTR)

Sent: Monday, August 06, 2012 8:28 AM
To: TIMOTHY FISCHER; Hooten, Gwen
Cc: Cato, Becky (CONTR); Hertel, Bill (CONTR); Friedman, Chuck (CONTR); Lupton, Gregory (CONTR); Massie, Joyce (CONTR); Lucas, Paul EMCBC; Ransbottom, Robert (CONTR)
Subject: RE: Suggested Changes to the OU-1 VOC Investigation Work Plan

Good here, approved.

From: TIMOTHY FISCHER [mailto:Fischer.Timothy@epamail.epa.gov]
Sent: Thursday, August 02, 2012 3:34 PM
To: Hooten, Gwen
Cc: Cato, Becky (CONTR); Hertel, Bill (CONTR); Nickel, Brian; Friedman, Chuck (CONTR); Lupton, Gregory (CONTR); Massie, Joyce (CONTR); Lucas, Paul EMCBC; Ransbottom, Robert (CONTR)
Subject: RE: Suggested Changes to the OU-1 VOC Investigation Work Plan

none here...

-----"Hooten, Gwen" <Gwen.Hooten@lm.doe.gov> wrote: -----

To: TIMOTHY FISCHER/R5/USEPA/US@EPA, Brian Nickel <Brian.Nickel@epa.state.oh.us>
From: "Hooten, Gwen" <Gwen.Hooten@lm.doe.gov>
Date: 08/02/2012 12:25PM
Cc: "Cato, Becky (CONTR)" <Becky.Cato@lm.doe.gov>, "Hertel, Bill (CONTR)" <Bill.Hertel@lm.doe.gov>, "Friedman, Chuck (CONTR)" <Chuck.Friedman@lm.doe.gov>, "Lupton, Gregory (CONTR)" <Gregory.Lupton@lm.doe.gov>, "Massie, Joyce (CONTR)" <Joyce.Massie@lm.doe.gov>, "Lucas, Paul EMCBC" <paul.lucas@emcbc.doe.gov>, "Ransbottom, Robert (CONTR)" <Robert.Ransbottom@lm.doe.gov>
Subject: RE: Suggested Changes to the OU-1 VOC Investigation Work Plan

Hey Tim and Brian,

I'm just checking to see if either of you have any further comments on the subject work plan. We're close to completing the work described in the work plan and would like your approval to mark the work plan as final if you have no objections or comments.

Thanks,

Gwen

From: TIMOTHY FISCHER [mailto:Fischer.Timothy@epamail.epa.gov]
Sent: Monday, June 11, 2012 1:36 PM
To: Brian Nickel
Cc: Cato, Becky (CONTR); Hertel, Bill (CONTR); Friedman, Chuck (CONTR); Lupton, Gregory (CONTR); Hooten, Gwen; Powell, Jane; Crombie, Joseph; Massie, Joyce (CONTR); Larry Kelly EMCBC; Proffitt, Mike; Lucas, Paul EMCBC; Ransbottom, Robert (CONTR)
Subject: RE: Suggested Changes to the OU-1 VOC Investigation Work Plan

I agree as well... Thanks!

-----"Nickel, Brian" <Brian.Nickel@epa.state.oh.us> wrote: -----

To: "Hooten, Gwen" <Gwen.Hooten@lm.doe.gov>, "Crombie, Joseph" <Joseph.Crombie@odh.ohio.gov>, Larry Kelly EMCBC <larry.kelly@emcbc.doe.gov>, "Lucas, Paul EMCBC" <paul.lucas@emcbc.doe.gov>, TIMOTHY FISCHER/R5/USEPA/US@EPA
From: "Nickel, Brian" <Brian.Nickel@epa.state.oh.us>
Date: 06/11/2012 12:05PM
Cc: "Cato, Becky (CONTR)" <Becky.Cato@lm.doe.gov>, "Friedman, Chuck (CONTR)" <Chuck.Friedman@lm.doe.gov>, "Hertel, Bill (CONTR)" <Bill.Hertel@lm.doe.gov>, "Lupton, Gregory (CONTR)" <Gregory.Lupton@lm.doe.gov>, "Massie, Joyce (CONTR)" <Joyce.Massie@lm.doe.gov>, "Powell, Jane" <Jane.Powell@lm.doe.gov>, "Ransbottom, Robert (CONTR)" <Robert.Ransbottom@lm.doe.gov>, "Proffitt, Mike" <Mike.Proffitt@epa.state.oh.us>
Subject: RE: Suggested Changes to the OU-1 VOC Investigation Work Plan

Approved.

From: Hooten, Gwen [mailto:Gwen.Hooten@lm.doe.gov]
Sent: Monday, June 11, 2012 12:44 PM
To: Nickel, Brian; Crombie, Joseph; Larry Kelly EMCBC; Lucas, Paul EMCBC; Timothy Fischer USEPA
Cc: Cato, Becky (CONTR); Friedman, Chuck (CONTR); Hertel, Bill (CONTR); Lupton, Gregory (CONTR); Massie, Joyce (CONTR); Powell, Jane; Ransbottom, Robert (CONTR)
Subject: Suggested Changes to the OU-1 VOC Investigation Work Plan

Brian, Tim, Joe, and Paul,

It has come to my attention that our technical team would like to make some changes to the subject work plan. They have all discussed these changes among themselves and have a consensus for changing the intervals as described in Becky Cato's e-mail excerpt below:

After several discussions with Brent Huntsman of Terran Corporation (sub to assist in soil-gas sampling phase) and Mike Proffitt of OEPA, it was suggested by Brent that our sampling intervals are too small and he has suggested using 4 to 5 ft. sampling intervals. His reasoning is that we would get adequate detail in our profile while spending less time and money in the field. I discussed the change with Mike Proffitt and he agreed that a 4 to 5 ft. sample interval for both soil and groundwater was acceptable and would provide us the detail of information we were wanting from this effort.

If you all would respond with your approval, I can direct Becky to revise Sections 2.1.1 and 2.1.2 of the subject plan, accordingly.

Thank you in advance for your prompt response!

Gwen

Gwendolyn Hooten
U.S. Department of Energy
Office of Legacy Management

11025 Dover Street, Ste. 1000
Westminster, CO 80021
720-880-4349 (office)
Gwen.hooten@lm.doe.gov

From:	Massie, Joyce (CONTR)
To:	Brian Nickel Ohio EPA; Ellen Stanifer City of Msbg; Frank Bullock MDC; Hooten, Gwen; Joe Crombie ODH; Lucas, Paul EMCBC; Timothy Fischer USEPA
Cc:	Anthony Campbell Ohio EPA; Cato, Becky (CONTR); Beth Moore MSBG; Friedman, Chuck (CONTR); David Lipp ODH; Hertel, Bill (CONTR); Joyce Massie home email; Larry Kelly EMCBC; Ransbottom, Robert (CONTR); Powell, Jane; Kleinrath, Art; rc-mound; Lupton, Gregory (CONTR)
Subject:	OU-1 Additional VOC Investigation Work Plan
Date:	Tuesday, August 07, 2012 12:58:46 PM
Attachments:	Mound OU1 Additional VOC Investigation Wk Plan Final approved.pdf

Attaching the final approved version of the subject plan.
This document will be added to the AR and will be placed on the LM Mound CERCLA AR website at http://www.lm.doe.gov/CERCLA_Home.aspx.
Thanks,
Joyce Massie, Public Affairs,
Stoller/JGMS Contractor for
US DOE Office of Legacy Management,
Mound Site
cell 937-287-1333
joyce.massie@lm.doe.gov