CRS ___

ExxonMobil
Refining & Supply Company
1001 Wampanoag Trail
East Providence, Rhode Island 02915
401 434 2900 Telephone
401 431 4028 Facsimile

ExxonMobil
Refining & Supply

October 8, 2009

Mr. Chad Staniszewski
New York State Department of
Environmental Conservation
270 Michigan Avenue
Buffalo, NY 14203

RE: EXXON MOBIL OIL CORPORATION
FORMER BUFFALO TERMINAL
625 ELK STREET
BUFFALO, NEW YORK
BROWNFIELD SITE #C915201
OPERABLE UNIT 2
WORK PLAN FOR ADDITIONAL FIELD PILOT TESTING

Dear Mr. Staniszewski:

Attached, please find the "Lime Kiln Dust Field Pilot Testing Work Plan" for Operable Unit 2 dated October 7, 2009 for the above referenced site. On behalf of ExxonMobil, GES is currently scheduling this scope of work. We will coordinate the schedule with NYSDEC availability so that you may witness the testing.

If there are any questions please call me at (401) 434-7356.

Sincerely,

J.A. Abel

Project Manager

ENVIRONMENTAL CONSULTING & MANAGEMENT
ROUX ASSOCIATES INC

209 SHAFTER STREET
ISLANDIA, NEW YORK 11749-5074 TEL: 631-232-2600 FAX: 631-232-9898

October 7, 2009

Mr. Joseph Abel
ExxonMobil Oil Corporation
East Providence Terminal
1001 Wampanoag Trail
Riverside, Rhode Island 02915

Re: Lime Kiln Dust Field Pilot Testing Work Plan
Operable Unit 2 (OU-2)
Former Buffalo Terminal
Buffalo, New York

Dear Mr. Abel:

Roux Associates, Inc. (Roux Associates) has prepared this Lime Kiln Dust (LKD) Field Pilot Testing Work Plan (Work Plan) for treatment of petroleum impacted soil in Operable Unit 2 (OU-2) at the ExxonMobil Former Buffalo Terminal (BCP Site #C915201) located at 625 Elk Street in Buffalo, New York. The proposed LKD field pilot test is designed to evaluate the performance of LKD to remediate petroleum impacted soil in OU-2 under field conditions. LKD was chosen for field pilot testing because of its efficacy at remediating petroleum impacted soil and cost effectiveness in a preliminary evaluation as compared to other bench scale testing materials: Portland Cement-Ground Granular Blast Furnace Slag grout (PC-GGBFS) and CETCO's organoclay. This Work Plan presents a detailed description of the proposed field activities.

Introduction

Previous investigations have identified petroleum impacted soil across OU-2, which includes grossly contaminated soil as defined by the New York State Department of Environmental Conservation (NYSDEC). The March 23, 2009 "Work Plan for Bench Scale and Field Pilot Testing in Operable Unit 2" submitted to the NYSDEC, provided approaches to evaluate potential options to remediate petroleum and lead impacted soils, the results of which will be provided in the final Alternatives Analysis Report (AAR) for OU-2. The March 23, 2009 work plan described bench scale testing of PC-GGBFS, LKD, and organoclay, and field pilot testing of nitrate and Regenesis' RegenOx^{TM}. The results of the bench scale and field pilot testing are summarized in subsequent sections. Detailed descriptions of the test methods and results will be provided in the final AAR for OU-2.

Summary of Bench Scale Testing Results

Bench scale testing consisted of mixing a composite soil sample collected from borings SB-107, SB-116, and SB-120 with 10 percent and 15 percent PC-GGBFS, 10 percent and 15 percent LKD, or a combination of 3.5 percent to 31.2 percent organoclay and

2.5 percent to 40.2 percent lime Portland cement (LPC). Comparisons of soil samples prior to and after treatment (48 hours after mixing for organoclay/LPC, and 28 days after mixing for PC-GGBFS and LKD) indicate all three reagents could potentially address visual and olfactory impacts due to petroleum hydrocarbons (i.e., presence of separate-phase product, sheen or petroleum odor).

Summary of Field Pilot Testing Results

Field pilot testing consisted of adding a 5 percent nitrate solution to two test plots, adding 8 pounds of RegenOx™ per cubic yard of soil to two test plots, and adding 15 pounds of RegenOx™ per cubic yard of soil to two test plots, for a total of six test plots. Soil samples from the two nitrate test plots were collected prior to and at 12 weeks after nitrate addition for laboratory analysis of volatile organic compounds (VOCs) and semivolatile organic compounds (SVOCs). Soil samples from the four RegenOx™ test plots were collected prior to and at one week, four weeks, and 12 weeks after RegenOx™ addition for VOC and SVOC analysis. Neither reagent resulted in a clear pattern of decreasing concentrations of VOCs and SVOCs. Moreover, there was no noticeable difference in visual and olfactory impacts due to petroleum hydrocarbons (i.e., presence of separate-phase product, sheen or petroleum odor) between soil samples collected prior to and at 12 weeks after treatment. Both nitrate and RegenOx™, therefore, were unsuccessful at remediating petroleum impacted soil and will not be pursued further.

Field Pilot Testing of Lime Kiln Dust

The proposed field pilot test will consist of adding and mixing LKD with an excavator to two 20 foot by 20 foot test plots at two areas in OU-2, for a total of four test plots (Figure 1). The two areas that were selected to evaluate the performance of LKD to remediate areas identified as containing moderate (located in previously excavated test trench TT-35) and high (located in previously excavated test trench TT-39) petroleum impacts under field conditions. At each area, LKD will be applied at a dosage rate of 5 percent to soil by weight at one test plot, and at a dosage rate of 10 percent to soil by weight at the other test plot. Both test plots will be mixed from land surface to the native clay layer (approximately 4 to 6 feet below grade). Prior to adding LKD, a representative baseline soil sample that is a composite of five grab samples from each test plot will be analyzed for the following parameters (VOCs will be collected as a grab sample from the center of the field test plot):

- Visual and olfactory observations of impact due to petroleum hydrocarbons (i.e., presence of separate-phase product, sheen or petroleum odor), including field screening for odor emissions using a photo-ionization detector (PID);
- pH;
- VOCs per United States Environmental Protection Agency (USEPA) method 8260; and
- SVOCs per USEPA method 8270.

The above procedures and analyses will be repeated following 28 days of curing to evaluate the field performance of the LKD. Lead analysis will not be performed since the two selected areas contain relatively low lead concentrations. The results of the LKD field pilot test will be incorporated into the final AAR for OU-2.

If you have any questions or need additional information regarding this Work Plan, please do not hesitate to contact us.

Sincerely,

ROUX ASSOCIATES, INC.

Wai Kwan, Ph.D.
Project Engineer

Noelle M. Clarke, P.E.
Principal Engineer

OPERABLE UNIT 2

TEST TRENCH WHERE MODERATE PETROLEUM IMPACTED SOIL WAS IDENTIFIED

SB-122

NTY-T189

TT-35

10 PERCENT LIME KILN DUST TEST PLOTS

SB-121

TT-39

NTY-T80

5 PERCENT LIME KILN DUST TEST PLOTS

NTY-T187

SB-123

TEST TRENCH WHERE HIGH PETROLEUM IMPACTED SOIL WAS IDENTIFIED

23

146

152

153

LEGEND

- SB-122 — LOCATION AND DESIGNATION OF SOIL BORING
- TT-35 — DESIGNATION OF TEST TRENCH
- PETROLEUM IMPACTED SOIL
- NOT OBSERVED DUE TO SURFACE WATER
- NOT OBSERVED DUE TO CONCRETE/ ASPHALT OBSTRUCTION
- PROPOSED LOCATION OF LIME KILN DUST TEST PLOT

N

80' 0 80'

Title:

LIME KILN DUST FIELD PILOT TESTING LAYOUT

EXXONMOBIL FORMER BUFFALO TERMINAL
BUFFALO, NEW YORK

Prepared For:

EXXONMOBIL OIL CORPORATION

ROUX ASSOCIATES, INC.
Environmental Consulting and Management

Compiled by: W.K.	Date: 07OCT09	FIGURE
Prepared by: W.K.	Scale: AS SHOWN	1
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