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FINAL
WORK PLAN
FOR
CENTRIFUGE GROUNDWATER EXTRACTION/TREATMENT SYSTEM
FORMER NAVAL SURFACE WARFARE CENTER-WHITE OAK
SILVER SPRING, MARYLAND

Prepared for:

DEPARTMENT OF THE NAVY
EFA Cheasapeake
901 M Street SE Building 212
Washington, D.C.
Contract No. N62470-97-D-5000

Prepared by:

OHM Remediation Services Corp.
Trenton, New Jersey

Philip A. Tully, P.E.
Senior Project Manager

Reviewed by:

John P. Franz, P.E
Program Manager

June 3, 1999
OHM Project 776273
Delivery Order No. 024

Section: 06.02
Site 20903-5640 (White Oak)
Doc. #: 0002

00153

OHM Remediation Services Corp.
A Subsidiary of OHM Corporation

June 4, 1999

Ms. Kim Bellis
Department of the Navy
EFA Chesapeake
901 M. Street, Building 212
Washington, D.C. 20374-5018

Re: Final Work Plans
Delivery Order No. 024
Site 46, Groundwater Remediation System
Former Naval Surface Warfare Center – White Oak
Contract No. N62470-97-D-5000

Dear Ms. Bellis:

Enclosed in the final Work Plan for Site 46, delivery order no. 024. This plan incorporates comments received from the EPA and MDE. Appendix B has been added which provides comments received from EPA and MDE and OHM's response to these comments.

If you have any questions or require additional information please contact me at (609) 588-6348.

Sincerely,

Philip A. Tully, P.E.
Senior Project Manager

Pc: Walter Legg – EFA Chesapeake
Frank Nicol – ROICC Bethesda
Dave Leadenham – OHM
Fred Poulin – OHM
Yazmine Yap-Deffler – EPA Region III
Jeff Thornburg - MDE
OHM Project File 776273

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1.0 INTRODUCTION

OHM Remediation Services Corp. (OHM) is pleased to present this Work Plan for Delivery Order 024. This Delivery Order is for installation of a groundwater remediation system at the former Naval Surface Warfare Center – White Oak, Silver Spring, Maryland, under contract No. N62470-97-D-5000, Delivery Order 0024.

1.1 EXISTING CONDITIONS

The centrifuge is an open topped cylindrical structure with cast concrete sides and a concrete/asphalt floor, measuring approximately 80 feet in diameter by 10 feet deep. A drain in the floor discharges at an outfall in a nearby swale. The centrifuge was designed and constructed between April 1962 and February 1964 and used for somewhere between 3 and 10 years (based on the recollections of former NSWC White Oak employees). The centrifuge was used for underwater explosions research. A small explosive charge was placed in a water-filled tank at the end of the centrifuge arm. A high-speed camera in the arm at the hub recorded the explosion as the centrifuge was under acceleration. Phenomena occurring there could be related to similar full-scale phenomena, and the behavior of conventional or nuclear underwater explosions could then be predicted. The centrifuge has been inactive since at least the 1970s.

The centrifuge contains a large center-mounted aircraft-type wing. Surface water in the centrifuge is collected in a surface drain and discharges to the swale southwest of the site. As reported by retired facility personnel, the unit was used occasionally to store solvent-containing drums following cessation of the research operations at the centrifuge. The drums were stored at the site for an undetemmined length of time.

Groundwater monitoring wells have been installed in proximity to the centrifuge. Groundwater sampling results suggest that a release of TCE has occurred in the immediate vicinity of the centrifuge, because groundwater at and downgradient of the site is contaminated with TCE. In addition, contamination associated with gasoline (i.e., benzene, toluene, xylene, and ethylbenzene) was identified in a groundwater monitoring well located on the eastem berm of the centrifuge. An underground storage tank was located in this area and used during the operation of the centrifuge.

The results of soil gas surveys and subsurface soil sampling did not identify the presence of significant VOC contamination in soil beneath or near the centrifuge. Therefore it is presumed that contamination at the centrifuge is present only within the groundwater and that groundwater extraction and treatment in this area will restore the site and facilitate reuse while limiting further contaminant transport to downgradient areas. Based on the location of the chlorinated VOC plume, it appears that it may be related to historic usage of the drain/outfall associated with the centrifuge.

The Site W swale is an intermittent stream located east of the ARL Building 500 complex and south of the centrifuge. TCE-contaminated surface water was identified within the Site W swale during previous investigations. A groundwater seep present along the east side of the small valley is a southward extension of the Site W swale, at a point less than 100 feet south of Floral Drive. This seep, which emanates from the hillside at an elevation of approximately 14 feet above the stream level, is contaminated with VOCs, primarily TCE, which has been detected at a concentration of 74 micrograms/Liter (μg/L). Investigations completed at Site 46 identified VOC-contaminated groundwater in areas immediately upgradient of the seep. In addition, an area of TCE-contaminated groundwater extends eastward from the Site W swale.

This portion of the groundwater plume that is located immediately east of the Site W swale, as well as the surface water conveyed within the Site W swale, is currently collected and treated by the Site W swale treatment system. The collection and treatment system, constructed in the fall of 1998, consists of a subsurface trench, collection sump, and air-stripping unit. Treated groundwater and surface water are conveyed to the culvert discharging beneath Floral Drive and ultimately Paint Branch. The current collection and treatment system is treating an estimated 15 gallons per minute, based on flow measurements made since installation of the treatment system.

2.0 PRE-MOBILIZATION ACTIVITIES

2.1 PRE-CONSTRUCTION SUBMITTALS

Included in the appendix to this work plan are the following:

- Draft Health & Safety Plan (Appendix A)

2.2 PRE-CONSTRUCTION MEETING

Prior to mobilization, the OHM Regional Operations Manager, Senior Project Manager, and Site Superintendent will meet with the EFA Ches RPM and ROICC for the pre-construction and mutual understanding meeting. This one-day meeting will review scope, schedule, and budget for the project, and will be considered the kick-off meeting for the project. Other interested parties such as representatives from the facility and A&E are also encouraged to attend.

2.3 PRE-CONSTRUCTION LAYOUT AND STAKEOUT

Prior to mobilization, OHM will survey the site. The extraction well locations, trench line location and control shed location will be staked out and marked. The laydown area, decontamination area, and work zones will also be identified and staked.

3.0 SITE CONSTRUCTION ACTIVITIES

3.1 MOBILIZATION OF PERSONNEL & EQUIPMENT

OHM will mobilize personnel and equipment to perform all activities associated with the removal action. Coordination of the delivery of equipment and mobilization of personnel will be performed from OHM's Trenton, New Jersey; Pittsburgh, Pennsylvania; and Richmond, Virginia facilities.

3.2 SITE SET-UP

OHM has established a temporary office at Building 510.

Silt fence will be installed where soil will be disturbed.

If necessary, a few trees may have to be cleared to accommodate the construction of the control shed.

3.3 EXTRACTION WELL

An OHM Hydrogeologist will supervise and direct the installation of dissolved phase TCE recovery wells at the inactive centrifuge area. A total of 3 recovery wells and 1 monitor well will be installed in accordance with these project specifications. The location of all the recovery wells is in the area of the centrifuge facility and outfall structure located to the southwest of the facility. The drilling locations are accessible to a truck-mounted drill rig.

Upon arrival, at completion, and between each well installation, all drill tools will be deconned at a decon pad provided by OHM. Prior to well installation, split-spoon soil samples will be collected from boreholes at five foot intervals to evaluate the heterogeneity of the subsurface soils and confirm the target depth of the well which is a saprolite layer at approximately 45 to 50 bgs. The sediments will be described by the OHM Hydrogeologist according to the Unified Soil Classification System (USCS). The subsurface lithology and well construction details will be documented on a separate log sheet for each well.

The recovery well boreholes will be advanced by mud rotary/casing advancement drilling method, using a 10.5-inch outside diameter rotary bit. If necessary, potable water may be used to fill the casing, creating a pressure head to reduce the potential of running sands entering the casing. Once the casing has reached the target depth, the well screen and riser casing will be placed inside the temporary casing. The well screen will be constructed of six-inch diameter, 20 slot, schedule 40 PVC, with bottom well plug. The riser pipe will also be constructed of schedule 40 PVC casing. The screened interval will extend from the saprolite to 10 feet below the water table (water table estimated to be approximately 20 feet bgs). Riser casing for recovery wells will be completed two feet above grade with no additional casing protection. A lockable well cap will be placed on the recovery well. The filter pack (# 2 Morie sand or equivalent), will then be placed in the annular space. As the filter pack is added, the augers will be slowly withdrawn from the borehole, ensuring the top of the filter pack remains above the bottom of the auger bit. The top of the filter pack will terminate at the water table. A two foot hydrated bentonite seal will be placed above the well sand. The remaining annulus space will be filled with a cement grout to 3 feet bgs. A complete recovery well construction diagram is indicated in Figure 4 of the Tetra Tech design report.

Drilling mud will be placed in drums, sampled, and analyzed for waste characterization disposal. A single composite sample will be obtained.

Each recovery well will be developed by mechanical surging and over-pumping. It is anticipated that the yield from each well will be 2 to 3 gpm. Mechanical surging will be accomplished using a surge block. Developing will be complete when the well screen within the water column has been completely surged and the pumped water is visibly clear of fines. All fluids removed from the wells will be stored in drums, sampled, and analyzed for waste disposal characterization. A single composite sample will be obtained.

All on-site activity, including drilling, decontamination procedures and materials handling is anticipated to take place in Level D personal protection.

3.4 EXCAVATION/PIPE INSTALLATION/BACKFILL/COMPACTION

Once the extraction wells are installed, OHM will start excavation and installation of the piping. Excavation will be performed using a trenching machine. Depth of excavation will be approximately three feet. One-inch HDPE piping will be installed between each well casing and the equalization tank. Two inch butt-fusion welded HDPE will be used to convey groundwater from the equalization tank to the downstream manhole. Clean-outs will be placed approximately every two hundred feet. Containment pipe will not be installed. Pipe bedding will be backfilled around the pipe to approximately six inches above the top of the pipe. Excavated soil will be used to backfill the remainder of the excavation. Detectable warning tape will be placed along the entire trench line at an approximate depth of 12 inches.

The entire pipe section will be pneumatically pressure tested upon completion of installation and backfill.

The trench will be compacted after backfilling is complete.

3.5 TREATMENT SYSTEM INSTALLATION

OHM will construct a control shed near the groundwater extraction wells. OHM will propose a location to the Navy for approval prior to construction of the shed. The control shed will be constructed on-site per the following specifications:

- 12 feet wide by 14 feet long by 8 feet high insulated wood building
- 2 x 4 walls, 16" O.C.
- 2 x 4 rafters, 16" O.C.
- 4/12 roof pitch
- ½ plywood roof sheathing
- Shingle Roof
- ½ inch wall sheathing
- T111 plywood siding
- Four inch wall and roof insulation with vapor barrier
- ½ inch sheetrock on inside walls and ceiling
- Two coats latex paint (white)

The shed will be provided with the following:

- Lights, interior (2) and exterior (1)
- Receptacles
- Heater w/ thermostat
- Exhaust fan w/ thermostat

The building will be placed on a new reinforced concrete pad (4,000 psi). The pad will have approximate dimensions of 16 feet by 18 feet by 8 inches and will be reinforced with 6 x 6 WWF.

The source of existing electrical service is Building 389. Calculations indicate that 100 amp power will be adequate. It is expected that 230 volt, single phase power will be necessary to run the well pumps and the unit heater, 110 volt, single phase power will be sufficient for lights, receptacles, etc.

OHM proposes to locate the equalization tank inside the control shed. The tank is relatively small (approximately 250 gallons) and locating inside would eliminate the need for freeze protection. The tank will be covered and vented through the shed roof. The tank will also be equipped with a drain line to allow for solids removal and maintenance of the tank.

Valves, gauges, etc. will be installed inside the control shed.

Extraction well pumps will be controlled with level switches (high and low) located inside the wells. The pumps can also be manually operated.

All electrical controls will be housed in a NEMA 4 enclosure located inside the control shed. A H-O-A switch will be provided for each well pump and equalization tank submersible pmp. Each pump will be provided with a motor starter. Alarm interlocks with indicator light and reset button will be provided.

An autodialer will be installed to alert remote parties in the event of a system shutdown.

3.5 SITE RESTORATION

All disturbed areas will be restored upon completion of work. Excavated areas will be seeded and fertilized. Hay will be placed over top of seeded areas. These areas will need to be watered for several days. OHM will make arrangements to perform this task. Silt fence will remain in place until sufficient vegetation occurs.

4.0 POST CONSTRUCTION SUBMITTALS

4.1 PROJECT CLOSEOUT REPORT

Upon completion of construction, OHM will submit a project closeout report which will provide a summary of activities performed under this delivery order.

APPENDIX A
HEALTH AND SAFETY PLAN

APPENDIX B
REGULATORY COMMENTS/RESPONSES

Tully

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION III
1650 Arch Street
Philadelphia, Pennsylvania 19103-2029

April 20, 1999

Mr. Walter Legg
Engineering Field Activity Chesapeake
Washington Navy Yard, Building 212
901 M Street, S.E.
Washington, DC 20374-5018

Re: Review of Draft Work Plan for Centrifuge Groundwater Extraction/Treatment System for the Former Naval Surface Warfare Center

Dear Mr. Legg:

EPA has reviewed the above report and have the following comments:

GENERAL COMMENTS

1. It is unclear from the WP or the Basis of Design Report (TetraTech NUS, 1999) whether the groundwater extraction/treatment system proposed for the centrifuge area is adequate for capturing and treating contaminated groundwater. Neither report provides calculations or verification of the well size, pumping rate, treatment rate, system capabilities, etc. This information should be provided.

2. It is recommended that soils be monitored for evidence of contamination during recovery well installation and trench excavation. Monitoring should include visual observation and a PID/FID to determine if soil contamination exists in the area.

3. The WP does not provide a schedule for removal actions. A primary component of the WP is the schedule. A schedule should be provided for review and reference.

4. The WP does not provide job descriptions or address lines of authority. It is unclear from the text who will be in charge of the work and who has authority for implementing specific procedures identified in the WP and other plans. The Work Plan should be clarified.

SPECIFIC COMMENTS

1. *Section 3.2, page 3-1.* The text states that "silt fence will be installed along the fence and in other areas as necessary." It is unclear what fence is referred to in the text. Section 1.1 does not describe any fencing around the centrifuge area. The text should be revised or a

figure provided that delineates the centrifuge area and the proposed areas for silt fence construction.

2. *Section 3.3, page 3-2.* The text states that drill cuttings and recovery well development water will be placed in drums, sampled, and analyzed for disposal characteristics. Additional information should be provided, including frequency of sampling, sample collection methods (i.e., composite or grab), and analytical methods that will be used to characterize waste.

If you have any questions, you may contact me at (215) 814-3369.

Sincerely,

Yazmine J. Yap-Deffler
Remedial Project Manager
Federal Facilities Branch

cc: Henry Sokolowski, EPA Region III
Jeff Thornburg, MDE
Steven Richard, GSA
Robert Craig, Adelphi Research Laboratory

SITE 46 WORK PLAN
RESPONSE TO EPA REGION III COMMENTS

1. Questions pertaining to the design of the treatment system should be addressed to the A&E, Tetra Tech NUS.
2. OHM will have a PID on-site during excavation activities and will be making visual observations to determine of contamination exists.
3. The schedule is currently being revised to reflect a start date of May 10, 1999. Construction of the control shed and installation of conveyance piping will start the week of May 10th. Extraction wells will be installed the week of May 17th. The system will be in operation by the end of June.
4. The OHM project manager is Phil Tully. The project manager directs all aspects of the delivery order and monitors project costs and schedule. The project manager delegates day-to-day execution authority to the superintendent.

   The OHM superintendent is Fred Poulin. The superintendent is responsible for the construction phase of the project and ensures work is performed in accordance with the work plan and applicable construction standards, codes, etc. Ensures work is performed within budgeted costs and schedule.

   The OHM superintendent has primary responsibility for ensuring work is executed in accordance with the work plan. If conditions change requiring a deviation from the work plan the superintendent and/or project manager will notify the ROICC and RPM prior to proceeding with work.

SPECIFIC COMMENTS

1. Silt fence will be installed in areas where soil will be disturbed. Specifically, silt fence will be installed in the area where the control shed will be installed and down gradient to the location of the extraction wells.
2. OHM will obtain a grab sample of the drill cuttings and development water and send to an off-site laboratory for complete waste disposal analysis. One sample of each will be taken.

MARYLAND DEPARTMENT OF THE ENVIRONMENT
2500 Broening Highway • Baltimore Maryland 21224
(410) 631- 3000 • 1- 800 -633-6101 • http:// www. mde. state. md. us

Parris N. Glendening
Governor

Jane T. Nishida
Secretary

April 22, 1999

Mr. Walter Legg
Engineering Field Activity, Chesapeake
Washington Navy Yard, Building 212
901 M Street, SE
Washington DC 20374-5018

RE: Draft Project Work Plan and Health and Safety Plan for the Centrifuge Groundwater Remediation Project at the Former NSWC White Oak, Maryland, dated: March 1999

Dear Mr. Legg:

Enclosed are comments from the Maryland Department of the Environment, Waste Management Administration on the above-referenced document.

If you have any questions, please contact me at (410) 631-3440.

Sincerely,

Jeff Thornburg
Remedial Project Manager
Federal/NPL Superfund Division

cc: Ms. Kim Bellis, EFACHES
Ms. Yazmine Yap-Deffler, EPA Region III
Mr. Richard Collins
Ms. Shari Wilson

Maryland Department of the Environment
Waste Management Administration
Environmental Restoration and Redevelopment Program
Comments on:

Draft Project Work Plan and Health and Safety Plan for the Centrifuge Groundwater Remediation Project at the Former NSWC White Oak, Maryland, dated: March 1999

General Comment

In the event of an air stripper failure, contingency measures are in place at the Site W swale to prevent the discharge of contaminated groundwater to surface water bodies. A vertical riser pipe with the capacity to store untreated wastewater for a 24-hour period is in place to prevent off-site migration of accumulated water pending repairs to the unit. Inevitably, the holding time of the riser pipe will be lessened once the waste stream from the centrifuge extraction well system is introduced to the Site W swale collection trench. The Navy should consider modifications to the existing contingency measures to account for the additional burden to the system. Electrical shut-off devices, a larger holding vessel, or other preventative measures should be considered.

SITE 46 WORK PLAN
RESPONSE TO MDE COMMENTS

1. The easiest and most cost-effective way to increase the capacity of the swale would be to increase the height of the riser pipe.