Draft

Operable Unit 2 Remedial Investigation/ Feasibility Study Contractor Quality Control Plan

for the

Diamond Head Oil Superfund Site Kearny, New Jersey

Prepared for:
U.S. Environmental Protection Agency
Region II
290 Broadway, New York

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February 2009

299597

Prepared under:
USACE Contract No.
W912DQ-08-D-0016
Task Order No. .....

Draft Contractor Quality Control Plan
for Operable Unit 2 Remedial Investigation/Feasibility Study

Diamond Head Oil Superfund Site
Kearny, NJ
USACE Contract No. W912DQ-08-D-0016
Task Order No. .....

Approved:

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Acronyms

ARARs	Applicable or Relevant and Appropriate Requirements
ASTs	Above Ground Storage Tanks
CQCM	Contractor Quality Control Manager
CQCP	Contractor Quality Control Plan
ER	Engineering Regulation
FFS	Focused Feasibility Study
FS	Feasibility Study
HSP	Health and Safety Plan
IRM	Interim Remedial Measure
LIF	Laser Induced Fluorescence
LNAPL	Light Non Aqueous Phase Liquid
NCRs	Nonconformance Reports
NJDEP	New Jersey Department of Environmental Protection
P.E.	Professional Engineer
P.G.	Professional Geologist
PM	Project Manager
PRG	Preliminary Remediation Goals
QA	Quality Assurance
QAC	Quality Assurance Coordinator
QAPP	Quality Assurance Project Plan
QC	Quality Control
QCT	Quality Control Team
QMP	Quality Management Plan
QP	Quality Procedure
RAO	Remedial Action Objectives
RI	Remedial Investigation
RPM	Regional Project Manager
RTL	Review Team Lead
SAP	Sampling and Analysis Plan
SMP	Site Management Plan
SOP	Standard Operating Procedures
TM-1	Technical Memorandum 1
TM-2	Technical Memorandum 2
TRC	Technical Review Committee
UFP	Unified Federal Policy
USACE	United States Army Corps of Engineers
USEPA	United States Environmental Protection Agency
VOC	Volatile Organic Compound

1. Introduction

CH2M HILL has been retained by the United States Environmental Protection Agency Region 2 (USEPA 2) through the U.S. Army Corps of Engineers, Kansas City District (USACE) to perform the remedial investigation (RI) and feasibility study (FS) for Operable Unit 2 at the Diamond Head Oil Superfund Site (Site) located in Kearny, NJ (Hudson County). This Contractor Quality Control Plan (CQCP) has been developed to establish the processes for quality performance throughout the RI/FS project including field work and all end products/deliverables. Accordingly, the goals of this CQCP are:

- Identify field activities/end products/deliverables requiring quality control.
- Identify each critical stage of activities/end products/deliverables for which quality must be controlled.
- Define the acceptability criteria for each field activities/end products/deliverables.
- Define the methods and personnel to be used in determining if the acceptability criteria have been satisfied.
- Identify each member of the quality control team and their defined roles.
- Establish corrective action processes that would be implemented if the acceptability criteria are not met.
- Describe the documentation that will be maintained on quality control.

2. Project Description

CH2M HILL is performing the remedial investigation and feasibility study activities for Operable Unit 2 at the Diamond Head Oil Superfund Site (Site) in Kearny, New Jersey. The Site is a former oil reprocessing facility, which was in operation until early 1979. During facility operations, multiple aboveground storage tanks (ASTs) and underground pits were used to store oily wastes. These wastes were intermittently discharged directly to adjacent properties to the east and the wetland area on the south side of the site, creating an oil lake covering an estimated 5 acres. The oil lake was subsequently filled but a light non aqueous phase liquid (LNAPL) is currently present on top of the groundwater table in that area. Wastes, believed to be construction-related, were also disposed of in a landfill currently covering an estimated 7 acres. Contaminants identified at the site during previous investigations include volatile organics, semi-volatile organics, pesticides, PCBs and metals.

The general objectives of the OU2 RI activities are to investigate whether the Site has resulted in contamination in soil, groundwater, and sediment beyond the physical boundaries of the former Diamond Head Oil Refinery property. The OU2 investigation is planned in a phased approach. The findings from the initial investigation activities will serve as the basis for assessing whether there are potential impacts beyond the institutional boundaries of the property, and whether there is a need for follow-up investigations to determine the extent of the identified offsite impacts. The data collected from the OU2 investigation activities will then be used to support a feasibility study which will evaluate appropriate alternatives to address the contamination identified to be of concern. Further details regarding the project objectives, scope of work, and product milestones are presented in the Work Plan and are also provided in the following sections.

2.1 Project Objectives

The general objectives of this initial phase of the OU2 RI/FS are to:

- Investigate whether groundwater contamination in the unconsolidated overburden water bearing unit above the peat has migrated beyond the physical boundaries of the property.
- Investigate whether chemical contamination exists in the soils within the footprint of the former lagoon which extended in the general area of the Interstate I-280 cloverleaf.
- Investigate whether sediment contamination continues to be present in the drainage swale along the east and south borders of the property following apparent New Jersey Department of Transportation (NJDOT) sediment removal activities as part of general I-280 maintenance.
- Investigate sediment contamination in the drainage swale downgradient of the property upto its confluence with Frank's Creek.

- Prepare a Technical Memorandum presenting the results the RI activities.

The detailed technical approach for meeting these general objectives is described in the Work Plan. The documents describing the specific procedures that will be used and presenting the results of the conducted activities are described in the next section.

2.2 Project Scope of Work

The following tasks will be performed by CH2M HILL during this project:

- Revise the following existing project plans to reflect this initial phase of OU2 activities:
  - Uniform Federal Policy - Quality Assurance Project Plan (UFP-QAPP)
  - Contractor Quality Control Plan (CQCP).
  - Health and Safety Plan (HSP)
  - Site Management Plan (SMP)
- Completing the RI field investigation activities described in the Work Plan and following the procedures in the project plans.
- Reporting of the RI results, conclusions, and recommendation in a Technical Memorandum.

Details pertaining to the aforementioned tasks are presented in the subsections below.

2.2.1 Uniform Federal Policy – Quality Assurance Project Plan

The QAPP developed for the Focused Phase 2 RI will be revised to reflect the quality assurance and quality control (QA/QC) protocols necessary to achieve the data quality objectives established for the OU2 RI/FS. For this phase of activities, the project will fully transition into using a UFP-QAPP and not continuing to update the Sampling and Analysis Plan (SAP) which had been prepared at the start of the Phase 1 activities and revised prior to the start of the Focused Phase 2 activities. The QPP will include all sampling standard operating procedures (SOPs) which are necessary to complete the OU2 field activities.

2.2.2 Contractor Quality Control Plan

This CQCP will provide CH2M HILL's process for delivering quality work end products while maintaining quality performance throughout the project. The CQCP will identify each project end product and demonstrate the procedures which will ensure that acceptability criteria have been achieved at each critical stage.

2.2.3 Health and Safety Plan

Revisions to the HSP will be made to include the additional OU2 RI tasks. The revisions are needed in order to include new potential risks and methods of prevention specifically associated with the OU2 RI tasks. The HSP will also be updated with the most current exposure concentrations obtained from the recently completed investigation activities.

2.2.4 Site Management Plan

The existing SMP will be revised to reflect OU2 activities. The plan will describe management responsibilities, contact information, and onsite management procedures and planned field facilities and locations.

2.2.5 Field Investigation Activities

CH2M HILL and its subcontractors will perform the OU2 activities described in the Work Plan. These will consist of site preparation activities; soil boring and monitoring well installation; and soil, groundwater and sediment sampling.

2.2.6 Technical Memorandum

A Technical Memorandum (TM) will be prepared following the completion of all RI field activities including demobilization of field equipment. The TM will present the results of the OU2 investigation activities including recommendations for path forward.

2.3 Product Milestones

Major product milestones are identified in Table 2-1. A more detailed schedule will be developed prior to field mobilization based on input from subcontractors and equipment vendors. The detailed schedule will be provided to the USEPA 2, USACE, and project staff to allow all parties sufficient time for project planning activities.

3. Organization and Responsibilities

The organization and responsibilities of the product development and quality control team are outlined in the following subsections. The organization of the team has been established in order to provide clear lines of functional and project responsibility. In addition, a defined management control structure is in place for this project. The control structure involves the USEPA 2 Project Manager (PM), USACE PM, and the CH2M HILL PM. Details of CH2M HILL's Project Delivery Team and Quality Control Team, are presented below.

3.1 Project Delivery Team

CH2M HILL will assemble a team of engineers and scientists to complete the OU2 scope. A list of core project team members, disciplines, and assigned roles is presented in Table 3-1.

3.2 Quality Control Team

The members and responsibilities of the Quality Control Team (QCT) are described in the following sections. This team will proceed under the direction of the Contractor Quality Control Manager (CQCM)/Review Team Lead (RTL) and follow the quality control procedures outlined in this CQCP. The CQCM/RTL is responsible for implementation of the CQCP by all members of the QCT so that high quality is achieved and maintained throughout the project. The QCT will review product deliverables explicit to their discipline and project role as described in the following subsections. Recommendations and the approval or disapproval of all final products will be made by the appropriate quality control team member to ensure utilization of each member's technical expertise. Table 3-2 summarizes the responsibilities of the QCT.

3.2.1 Contractor Quality Control Manager/Review Team Lead

The CQCM RTL is responsible for overall implementation and executions of this CQCP by all quality control team members. The CQCM/RTL will ensure that all activities undertaken on this project undergo the appropriate quality control measures as described in the CQCP. Mr. Mark Lucas will be the CQCM/RTL for this project. Mr. Lucas served as the RTL during the Phase 1 and 2 activities and has project management and technical experience with USEPA 2 work assignments.

3.2.2 Project Manager

Juliana Hess will serve as the CH2M HILL Project Manager during the OU2 RI/FS. Ms. Hess will review all draft and final end products prior to delivery to the USEPA 2 and USACE to confirm that all end products meet CH2M HILL's quality standard and that the project objectives have been achieved and accurately documented.

3.2.3 Quality Control Inspectors of Field Work

The RI Task Lead will serve as the Quality Control Inspector for the field work. The Quality Control Inspector is responsible for quality performance of each field activity. He will oversee the field activities so that the requirements of this CQCP, along with the requirements in the UFP-QAPP, and other project planning documents, are being met. Mr. Andy Judd will serve as the RI Task Lead. The Task Lead will also be responsible for reviewing all documents prepared as part of the RI task prior to forwarding for review by the Independent Review Team.

3.2.4 Project Chemist

The project chemist will provide oversight of preplanning and field implementation of the sampling and analysis activities for the OU2 RI/FS. The project Chemist, Mr. Mike Zamboni, is also responsible for the UFP-QAPP and subcontractor laboratory SOPs, qualifications and QA plans. During the RI/FS field activities, Mr. Zamboni will oversee review activities for the analytical data. The project chemist will perform audits of subcontract laboratories, if required.

3.2.5 Quality Assurance Manager/Senior Technical Support and Independent Review Team

Senior technical support and quality assurance will be provided by Mr. Tom Palaia (LNAPL delineation and remedial alternatives) and Mr. Mark Lucas (RI activities, geology and hydrogeology). They will also comprise the Independent Review Team responsible for the independent review of technical deliverables. They will conduct technical reviews of end products including the planning documents and activities, field activity milestones, and technical memorandums and reports created following the field activities. The Quality Assurance Managers/Senior Technical Support members of the team will utilize their specialized knowledge to efficiently focus on all aspects of technical system designs, analytical and field data, and results and conclusions derived during the formation of each end product. They will not be involved in the day-to-day development of these products; however, may be consulted during the planning and development of the product when requested by the project team. Technical reviews will be conducted at the critical stages of development, during appropriate project milestones, during data interpretation, and of each end product to verify that the product meets the acceptability criteria presented in Section 6.0

4. End Products/Project Deliverables

End products, and their respective product objectives, are presented in the sections below.

4.1 Uniform Federal Policy – Quality Assurance Project Plan

For this phase of activities, the project will fully transition into using a UFP-QAPP and not continuing to update the SAP which had been prepared at the start of the Phase 1 activities and revised prior to the start of the Focused Phase 2 activities. The QPP will include all sampling standard operating procedures (SOPs). The objectives of the UFP-QAPP are to:

- Follow the explicit procedures and examples provided within the Uniform Federal Policy – Quality Assurance Project Plan (UFP-QAPP) Manual to develop the project QAPP.
- Detail project specific policy, organization, functional activities, and QA/QC protocols necessary to achieve the established data quality objectives.

4.2 Contractor Quality Control Plan

The objectives of the CQCP are as follows:

- Describe CH2M HILL's processes for quality control such that quality performance is maintained throughout the project.
- Describe the QC organization and demonstrate how documentation and investigation activities are monitored for compliance and quality end products.

4.3 Health and Safety Plan

The objectives of the revised HSP are to:

- Present the health and safety considerations specific to the OU2 activities. To that effect, the existing Phase 1 and Focused Phase 2 Health and Safety Plan (HSP) will be revised to include these considerations as well as contaminant exposure concentrations that are expected to be encountered at the site based on recent data obtained during Focused Phase 2 activities.
- Establish health and safety procedures and action levels for each of the activities to be performed at the site during the Phase OU2 RI.

4.4 Site Management Plan

The objectives of the SMP are to:

- Describe the facilities and onsite operations during the OU2 activities. To that effect, the existing Phase 1 and Focused Phase 2 SMP will be revised to include new information.
- Describe management roles and responsibilities, project contact information, and means of communication.
- Detail site specific access and security procedures, facilities and services, contingency procedures, storage of generated wastes, and field activities tracking and communications systems.

4.5 OU2 Investigation Field Activities

The objectives for the OU2 field investigation activities are presented in the Work Plan. The detailed procedures that will be employed by the project team are detailed in the UFP-QAPP, SMP, H&S Plans and in this CQCP. The project team will follow these procedures and deviations will be approved and documented before they are implemented.

4.6 Technical Memorandum

The objective of the Technical Memorandum is to present the results, conclusions, and recommendations on path forward following completion of the OU2 investigation activities. This TM will also serve as the basis for future evaluation of remedial alternatives as well as for defining data gaps for subsequent investigations that may be conducted at the site for overall site characterization and remediation.

5. Critical Stages for Control of Quality

Compliance with quality control requirements will be verified at each critical stage based on the milestone identified in Section 2.3. The end products/deliverables milestones listed in Section 2.1 can be divided into three categories: pre RI planning, execution of the RI field activities, and remedial investigation and reporting activities.

Several documents will be developed prior to the start of the OU2 field activities (UFP-QAPP, this CQCP, the HSP, and SMP). Field activities will begin following USEPA2 approval of these planning documents (USACE approval of this CQCP). Upon completion of the RI field activities, a TM will be prepared to document the results of the conducted investigations.

5.1 Control of End product/Deliverable Preparation

Quality control procedures at each critical stage of document development include:

- A draft of each document will be prepared in accordance to the task order received in January 2009.
- Before beginning work on a document, the Contractor Quality Control Manager/Review Team Lead will lead a discussion, as appropriate, between the Project Manager, the Quality Assurance Managers/Senior Technical Support staff, the Task Leads, and the project team to discuss the outline, scope, information, data analysis, and presentation to be included in each end product/deliverable. The objective of this discussion is to obtain input and guidance from the senior staff supporting the project and streamline the deliverable development and review process.
- Before beginning development of the draft deliverable, the outline resulting from the above discussion will be provided to USEPA 2 for review in order to ensure that the outline meets USEPA 2's needs for the report's contents.
- Internal product checks and interdisciplinary checks will be performed throughout document development.
- Following completion of a draft version, document reviews will first be completed by the appropriate Task Lead followed by review by the appropriate Quality Assurance Manager/Senior Technical Support member of the Independent Review Team (Table 3-2).
- Reviews will be coordinated by the Contractor Quality Control Manager/Review Team Lead. The Project Manager will also review all deliverables.
- The Contractor Quality Control Manager/Review Team Lead will then lead a discussion, as appropriate, between the Project Manager, the Quality Assurance Managers/Senior Technical Support member of the Independent Review Team who performed the review, the appropriate Task Lead, and the project team to

discus and resolve comments. A certification of comment resolution will be included with each document (Section 5.2.3).

- Revisions to the draft document will incorporate applicable comments or changes resulting from the review described above. Comments will be accepted or denied by the author based on the accuracy and validity of the comments. Section 6.0 details the acceptance criteria. Additional accepted scientific/engineering principles, historical data, and other considerations will be utilized in the determining the acceptability of comments.
- Once each appropriate Independent Review Team member has reviewed the draft document and the comments were addressed, a final review of the document for format, grammar, and spelling will be completed.
- Three hardcopies of the draft will be produced and issued to the USEPA 2 for review. One copy of all documents will also be submitted to the USACE for their files.
- Following USEPA 2 review, all comments will be addressed and changes will be incorporated into each document.
- Before beginning to revise the documents, the project team will identify comments in need of clarification and will contact USEPA 2 for this clarification. Following these discussions, the project team will prepare a letter for USEPA 2's review summarizing how each comment will be addressed. Revisions to the document will commence after USEPA 2's approval of the plan for addressing comments.
- Revisions to the document will follow the relevant parts of the process for preparing the draft document.
- Upon completing the final revisions, three copies of the final document will be submitted to the USEPA 2 and one copy will be submitted to the USACE.

Of note, review of the CQCP will be provided by the USACE.

5.2 Product Checks

Product checks regarding calculations, data accuracy, and the validity of information will be performed by the product development team during the document preparation process. Qualified individuals will focus on each appropriate section of each document dependant on their specialized discipline (Table 3-2). Each qualified individual will be selected and overseen by the Contractor Quality Control Manager/Review Team Lead. The product development team is responsible for coordination of checks and to ensure that a qualified checker has reviewed the document. Each checker will be selected in regards to their expertise, experience level and the task complexity and risk. Checks for all documents will include:

- Appropriate level of quality performance
- Data validity
- Accuracy and correctness of calculations
- Completeness of documentation

5.2.1 Interdisciplinary Checks

Interdisciplinary checks will be conducted between the development workers. The Task Leads and the appropriate members of the Independent Review Team will communicate throughout the product development process. The interdisciplinary checks will verify that the proper quality controls are followed for each task along with preventing conflicts between other portions of the project developed by another discipline. Each Task Lead and product development team member will be able to review the total scope of the entire product for overall quality performance.

5.2.2 Technical Reviews

Following the review of each document by the Task Lead, review of the document will be conducted by the appropriate Quality Assurance Managers/Senior Support member of the Independent Review Team. These reviews will be documented for each end product as described in Section 5.1. The Independent Review Team members possess the specialized technical, managerial, or specific task experience to review all end products. The personnel comprising the Independent Review Team are identified in Section 3.2.5.

5.2.3 Certification

The attachment to this plan contains the forms which will be signed to document the quality control process. The completed forms will be maintained in the project files.

5.3 Control of Field Activities

The RI and FS Task Leads will also serve in the roles of field Quality Control Inspectors and oversee the field personnel conducting the OU2 activities so that the acceptability and quality performance criteria are met. Prior to the initiation of the RI field activities, the RI Task Lead will inspect the site to ensure that the required planning activities have been completed and the appropriate materials and equipment for the field activities are in place. During routine visits to the site, the Task Leads will review whether the field activities follow pre-scribed procedures and whether field documentation is complete to document these activities. Immediate feedback will be provided to the field team on compliance with prescribed procedures and the completeness and accuracy of the documentation. If required by the Task Lead, field documentation will be returned to the originator for correction or completion.

A formal QC field audit will also be performed of each field activity. The purpose will be to review and document whether the activity follows the procedures in the applicable planning documents and whether field documentation is complete and accurate. The QC audit checklist completed at the end of the audit will be provided to the field team along with immediate feedback. Copies of the QC audit checklists will also be provided to the Contractor Quality Control Manager/Review Team Lead and Project Manager. The checklist will also faxed to the USACE and the USEPA 2 and the original maintained in the project files.

Checklists were developed to document the performed field QC audits. They cover the following activities: Soil boring installation, monitoring well construction, well development, groundwater sampling, and sediment sampling (Checklists 5-2 through 5-7).

Finally, the FTL will be responsible for daily reviewing the field activities and for completing a daily QC checklist. This checklist (Checklist 5-1) will be faxed daily to the USACE and the Task Lead / Project Manager and maintained in the onsite project files.

6. Acceptability Criteria

6.1 Field Activities Criteria

Acceptability criteria for the field and analytical activities are presented in all the planning documents. These contain the quality objectives for each activity, the standards that must be achieved, acceptability/performance criteria, applicable documentation, QC activities and frequencies, and persons responsible for development of the required QC documentation. A summary of the field activities criteria is provided below and summarized in Table 6-1.

Field activity
General quality objective will be as defined in the Work Plan (for example, install soil borings to investigate soil contamination within the I-280 cloverleaf).

Standards
The standards that will be followed are specified in all the planning documents (for example, the monitoring well construction SOP specifies the well construction standards).

Acceptability/Performance Criteria
The field activity will be deemed to be acceptable only if performed in accordance with the applicable standards (e.g., the procedures in the SOP). In some cases, all standards may not be attained. For example, soil borings may vary in depth due to the varying depth at which the peat layer occurs at the site. In all such cases, documentation will be maintained in the field log book as to the reasons why the desired performance criteria could not be achieved.

Applicable quality documentation
Complete the forms identified for the activity in the planning documents (for example, the forms in the groundwater sampling SOP). The frequency will be as specified in the planning documents (for example, per the SOP, measurements will be taken at the specified frequencies). The forms will be maintained onsite.

Complete the daily QC checklist and fax to the USACE and the Task Lead / Project Manager.

Complete the field QC audit checklist and fax to the USACE and USEPA 2.

Responsible Person
The FTL is responsible for completing the required documentation per the planning documents and the daily QC checklist. The RI Task Lead is responsible for performing the QC audits of each field activity. He is responsible for providing immediate feedback to the FTL and the field team on the results of the QC audits so that necessary changes can be made on a real-time basis.

Quality Control Activity/Frequency
The RI Task Lead will perform an initial review of site set-up followed by formal QC audits during the implementation of each field activity.

The FTL will complete the daily QC checklist daily.

The forms in the SOPs will be completed at the frequencies specified in the SOPs (for example, measurements will be taken at the specified frequencies during groundwater sampling).

6.2 Deliverables Criteria

The primary guidance that will be used for the development of the desired end products/deliverables is the Task Order Scope of Work for the Diamond Head Oil Superfund Site, Kearny, New Jersey, dated January 2009. Other product criteria will be obtained from applicable published USEPA 2 guidance documents. It is difficult to define acceptability criteria for deliverables because of the sometimes, subjective nature of the assessments in the technical evaluations presented in documents. As specific criteria are not readily available, it is important for the project team to closely follow, monitor, and document the process for controlling the quality of deliverables described in this CQCP.

6.3 Regulatory Criteria

Documents will be prepared and field activities conducted in accordance with applicable state and federal regulations. A listing of these regulations is presented below.

Code of Federal Regulations

29 CFR 1910 and 1926	Occupational Safety and Health Standards
40 CFR 61	National Emissions Standards for Hazardous Air Pollutants
40 CFR 257	Criteria for Classification of Solid Waste
40 CFR 260	Hazardous Waste Management Systems: General
40 CFR 261	Identification and Listing of Hazardous Wastes
40 CFR 262	Standards Applicable to Generation of Hazardous Waste
40 CFR 263	Standards Applicable to Transporting of Hazardous Waste
40 CFR 264	Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities
40 CFR 265	Interim Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities
40 CFR 267	Interim Standards for Owners and Operators of New Hazardous Waste land Disposal Facilities
40 CFR 268	Land Disposal Restrictions
40 CFR 270	Hazardous Waste Permit Program
40 CFR 300.415	National Oil Hazardous Substance Pollution Contingency Plan, Removal Action
16 U.S. Code (USC), Section 469	National Historic Preservation Act
29 USC, Section 651-678	Occupational Safety and Health Act
33 USC, Section 1251-1376	Clean Water Act
42 USC, Section 7401-7642	Clean Air Act
42 USC, Section 300(f)	Safe Drinking Water Act
49 CFR, Parts 107, 171-177	Hazardous Materials Transportation Regulations

40 CFR, Part 6, Appendix A	Protections of Wetlands
40 CFR 257.3	Protection of Wetlands and Endangered Species

State of New Jersey

N.J.A.C-7:7A	Freshwater Wetlands Protection Act Rules
N.J.A.C-7:9	Water Pollution Controls
N.J.A.C-7:9B	Surface Water Quality Standards
N.J.A.C-7:9C	Groundwater Quality Standards
N.J.A.C-7:14	Water Pollution Control Act
N.J.A.C-7:16	Worker and Community Right to Know Regulations
N.J.A.C-7-18	Regulations Governing the Certification of Laboratories and Environmental Measures
N.J.A.C-7:26	Solid Waste
N.J.A.C-7:26E	Technical Requirements for Site Remediation
N.J.A.C-7:26G	Hazardous Waste

7. Methods to Evaluate Compliance with Acceptability Criteria

As described in Section 5.0 of this CQCP, all documentation and memorandums will undergo a thorough multi-level QC review. Each document will first be reviewed by the Task Lead followed by review by the appropriate Project Quality Assurance Manager/Senior Technical Support member of the Independent Review Team and the Project Manager.

A preparatory inspection followed by formal QC audits of each field activity will be scheduled in advance and be conducted by the RI Task Lead. The preparatory and follow-up QC audits will be attended by the Project Manager as appropriate and may be attended by the USACE and USEPA 2 representatives.

During the QC audits, the RI Task Lead will review the activities for compliance with prescribed procedures and inspect the field documentation forms relevant to the specific task to verify that acceptability criteria have been achieved.

The results of the QC audits will be documented in a checklist developed specifically for each activity and which will be faxed to the USACE and USEPA 2 upon completion of the audit.

8. Nonconformances and Corrective Actions

If acceptability criteria are not achieved, the Project Manager will direct the project team or the responsible subcontractor to repair the item and/or redo the work in order to comply with the acceptability criteria. This may include, but is not limited to: re-sampling, re-testing or creating additional delineation points in order to bring the nonconforming condition into compliance. Re-sampling would be required if the samples were collected from the wrong location or sample depth or if the samples were improperly handled, labeled, or packed (for example, high temperature upon receipt at the laboratory or failure to maintain the samples at the temperatures prescribed in the QAPP). Re-analysis of the sample(s) would be required if the acceptance criteria and procedures presented in the QAPP required this action.

8.1 Nonconformance Reporting

Nonconformance reports (NCRs) will be issued by the CQCM/RTL for items or activities not meeting the acceptable criteria presented in Chapter 6.0 of this plan. Deficiency Notices issued by the USACE and USEPA 2 will also result in the preparation of an NCR by the CQCM/RTL. Nonconformance reports are used to document noncompliances (failure to meet the acceptability criteria) encountered during the normal course of conducting work or found during inspections. In the course of conducting some activities, it may not be possible to attain the specified acceptance criteria due to the encountered site conditions. An example of such a situation is not attaining the desired depth at a soil boring location due to the type of encountered materials. While this represents a deviation from the acceptance criteria, a corrective action to correct the situation is not possible. Nonconformance reports will not be issued for such situations. In other cases, the nonconformance may be due to the failure by the project team to follow the established procedures. An example of such a situation is noting improperly completed Forms II Lite paperwork during a QC inspection. An NCR issued for this situation will require a corrective action (for example, the Task Lead to review the requirements with the field person who made the mistake).

A NCR will, at a minimum, include the following:

- Detailed description of the nonconforming item or activity
- Cause of nonconformance
- Referenced criteria
- Recommended disposition /corrective action
- Disposition and verification corrective action
- Affected organization or subcontractor

8.2 Nonconformance Disposition

Nonconformance reports will be immediately issued to the CH2M HILL Project Manager and the responsible organization/group for disposition. Dispositions of NCRs will require

the responsible organization/group to identify the cause, corrective action, action to preclude recurrence and the date when all corrective actions will be completed. Corrective actions will be approved by the CQCM/RTL and the CH2M HILL Project Manager prior to implementation. Nonconformance reports will remain on open status until the corrective actions have been implemented and verified as acceptable by the CQCM/RTL and Project Manager.

Nonconformance reports will be submitted to the USACE and USEPA 2.

8.3 Consequences of Failure to Implement Quality Control

A lapse in the implementation of this CQCP plan could have a detrimental effect on the overall end products. Failure to achieve the proper level of QC could have negative effects at all levels of the project or across the project as a whole. Failures to implement QC actions will be reviewed to determine the cause of the failure, potential impacts to project, appropriate corrective actions, and potential impacts to the budget, schedule and the ability to meet the project acceptability criteria and goals. Deficiencies in QC implementation will be handled as a nonconformance as described above. The CQCM/RTL will immediately notify the CH2M HILL Project Manager of any QC implementation failures. The CH2M HILL Project Manager will inform the USACE and USEPA 2 of any QC failure. CH2M HILL will directly implement immediate corrective actions to prevent recurrence of the QC failure.

A consequence of a failure of QC is the possibility of an unfavorable A/E evaluation from the USACE.

9. Procedural Reviews

Standard Operating Procedures were developed for the Phase 1 and Focused Phase 2 activities and revised to incorporate the procedures and requirements (criteria and documentation) for the OU2 activities. New procedures were also developed. These procedures and the associated project-specific forms/checklists will be utilized to record information which will be used to assess whether conformance criteria have been achieved. The SOPs and forms can be found in the various planning documents and are not repeated here.

10. Documentation and Reporting

CH2M HILL will prepare and submit monthly reports to the USEPA 2 and USACE. The reports will briefly summarize the month's activities by task and discuss work progress, anticipated problems and solutions, deliverables, upcoming events, and financial status. The reports will be accompanied by a monthly invoice and discussion of the project schedule. The reports will also include discussion of any nonconformance (whether correctable or not).

All documentation related to the QC process and project execution will be maintained in the project record file system. Project files for the Site will be maintained in CH2M HILL's, Parsippany, New Jersey office.

The project files will be subject to an office audit by the CQCM/RTL or his designee and the audit report will be maintained in the project file.

If, during the course of field activities, it becomes necessary to request approval for a variance from the approved plans, a request for a variance will be made, where possible, prior to encountering the necessity to do so in the field. Written requests for a Field Work Variance will be submitted to the USACE and USEPA 2 prior to implementation and must be approved by the USACE.

11. References:

CH2M HILL, 2009. *Phase 2 Focused Remedial Investigation/Feasibility Study Health and Safety Plan for the Diamond Head Oil Superfund Site.* Region 2, Kearny, NJ.

CH2M HILL, 2009. *Phase 2 Focused Remedial Investigation/Feasibility Study Site Management Plan (Attachment A of the QAPP) for the Diamond Head Oil Superfund Site.* Region 2, Kearny, NJ. .

CH2M HILL, 2009. *Phase 2 Focused Remedial Investigation/Feasibility Uniform Federal Policy – Quality Assurance Project Plan for the Diamond Head Oil Superfund Site.* Region 2, Kearny, NJ.

Attachments

CH2M HILL STATEMENT OF TECHNICAL REVIEW
Diamond Head Oil Superfund Site, Kearny, New Jersey

Document name:

_____

_____

CH2M HILL has completed the technical quality review of the submittal of the above deliverable for the Diamond Head Oil Superfund Site, Kearny, New Jersey. Notice is hereby given that an independent technical review has been conducted that is appropriate to the level of risk and complexity inherent in the project, as defined in the Quality Control Plan. During the independent technical review, compliance with established policy principles and procedures, utilizing justified and valid assumptions, was verified. This included review of assumptions; methods, procedures and material used in analyses; the appropriateness of data used and level of data obtained; and reasonableness of the results including whether the product meets the customer's needs .

Document Preparer: Signature: Date:

_____

Task Lead Signature: Date:

_____

Project Manager	**CH2M HILL Independent Technical Reviewer**
Signature Date	Signature Date

CH2M HILL STATEMENT OF SIGNIFICANT COMMENTS
Diamond Head Oil Superfund Site, Kearny, New Jersey

Document Name:

Significant concerns expressed by the CH2M HILL review and the explanations of the resolution are as follows.

Comments:

CH2M HILL STATEMENT OF TECHNICAL REVIEW COMPLETION
Diamond Head Oil Superfund Site, Kearny, New Jersey

Document Name:

_____

_____

Verification/Acknowledgment

This is to certify that the CH2M HILL Project Team and Quality Control Team have met and reviewed the attached comments generated during the independent technical review of this document for the **Diamond Head Oil Superfund Site**, Kearny, New Jersey. All comments resulting from the CH2M HILL review have been resolved and incorporated. (Exceptions to be noted on attached pages.)

Document Preparer (print):

Signature: _____ Date: _____

Task Lead (print):

Signature: _____ Date: _____

Juliana Hess
Project Manager

Signature: _____ Date: _____

Tables

Table 2-1
Project Milestone OU2 Activities
Diamond Head Oil Superfund Site

Anticipated Date(s) of Initiation	Anticipated Date of Completion	Activities
Pre-remedial investigation planning		
		Submit OU2 Focused RI Planning Documents (UFP-QAPP, CQCP, HSP, SMP)
		USEPA 2 review of OU2 Focused RI Planning Documents CH2M HILL address USEPA 2 comments
		Procure subcontractors
OU2 Remedial investigation		
		Mobilize field facilities, equipment, and supplies and complete utility markout
		Complete soil boring and monitoring well installation
		Complete groundwater sampling
		Complete sediment sampling
Remedial Investigation Reporting and Feasibility Evaluation of Appropriate Remedial Alternatives		
Upon receipt of data	Eight weeks following receipt of data	Prepare a Technical Memorandum presenting the results of the OU2 investigation
Upon Completion of TM	Eight weeks after submitting OU2 TM	Prepare a Focused Feasibility Study Report
Schedule accounts for holiday downtime.		
Schedule assumes complete funding of project		

TABLE 3-1

Project Team Members, Disciplines, and Project Roles
Diamond Head Oil Superfund Site

Member	Project Roles	Office Location	Phone Number
Mark Lucas, P.G.	Contractor Quality Control Manager/Review Team Lead	Philadelphia, PA	(215) 640-9045
Juliana Hess, P.E.	Project Manager	Parsippany, NJ	(973) 316-0159 ext. 4550
Mark Lucas, P.G.	RI Quality Assurance Manager/Senior Technical Support	Philadelphia, PA	(215) 640-9045
Tom Palaia, P.E.	FS Quality Assurance Manager/Senior Technical Support	Denver, CO	(303) 717-2495
Mike Zamboni	Project Chemist	Chantilly, VA	(703) 376 5111 ext. 45301
Amini Mills	Compliance	Parsippany, NJ	(973) 316-9300
Matt Germon, P.E.	Feasibility Study Lead/QC Inspector	Boston, MA	(802) 453-5754
Andy Judd	Remedial Investigation Lead/QC Inspector	Parsippany, NJ	(973)-316-9300 ext. 4540
Steve Beck	Regional Health and Safety Coordinator	Milwaukee, WI	(414) 272-1052
Dave Reamer	Field Team Leader	Parsippany, NJ	(973) 316-0159 ext. 4520
Mike Murphy	Field Team Member	Parsippany, NJ	(973) 316-9300
Graham Sharkey	Field Team Member	Parsippany, NJ	(973) 316-9300
Delores Bellard-Bennett	CADD Specialist	Philadelphia, PA	(215) 640-9004
Angela Zelman	Administrative	Parsippany, NJ	(973-316-9300) ext. 4548

P.E. = Professional Engineer,
P.G. = Professional Geologist

Table 6-1
Objective, Standards, and Acceptance Criteria for Diamond Head Oil - Superfund Site
Kearny, Hudson County, NJ

Field Activity	Quality Objectives	Standards	Acceptability/Performance Criteria	Applicable Quality Documentation	Responsible Person	Quality Control Activity/Frequency
Mobilization	To ensure that all facilities, services, and equipment are properly in place and functioning.	•OU2 HSP •OU2 SMP	Project planning performed in accordance with specified standards including: •USACE and USEPA 2 approval to proceed •Project documents approved •Proper NJDEP approvals obtained •Analytical laboratories have been procured •Functioning equipment, facilities, and services	•QC Daily inspection checklist (5-1) •Documentation of activities in log book	Implementation: •FTL QC Review: •RI Task Lead	Site inspection by RI Task Lead prior to initiation of activities.
Health and Safety Implementation	To ensure that all site personnel, subcontractors, visitors and public are protected from physical harm and exposure. Ensure that all H&S equipment is in place and inspected as required by HSP.	•OU2 HSP •OU2 SMP	H&S equipment and supplies available onsite per HSP All work performed in accordance with the site HSP	•QC Daily inspection checklist (5-1) •Self-assessment checklist •Equipment calibration logs •Documentation of activities in log book	Implementation: •FTL •Field team QC Review: •Task lead	Site inspection by RI Task Lead prior to initiation of activities.
Soil boring installation and soil sampling	Obtain data to investigate whether chemical contamination exists in the soils within the footprint of the former lagoon which extended in the general area of the Interstate I-280 cloverleaf.	•OU2 Work Plan •OU2 SMP •OU2 QAPP •OU2H&S Plan •SOP Soil boring installation methods and soil sampling •SOP Borehole abandonment •SOP Subsurface Soil Sampling •Other related sampling SOPs (Sample Nomenclature, Chain of Custody Procedures, Field Parameter Forms, Sample Collection, Sample Packaging)	Installation of soil borings and collection of soil samples completed to specified standards including: • Proper calibration procedures • Proper decontamination of equipment • Careful selection of sampling depths and documentation of basis for selection • Proper collection, preservation, identification, and handling of soil samples • Sample quantities/volume • Followed standard procedure	•QC Daily inspection checklist (5-1) •QC Audit checklist specific to activity (5-2) •Field logs specific to each applicable SOP	Implementation: •FTL •Field team QC Review: •Task lead	QC audit of each activity by Task Lead. QC audit reviews whether activities follow prescribed procedures and accuracy and completeness of field documentation. Daily QC review by FTL.
Monitoring well installation	Install monitoring wells to collect data on whether contamination in groundwater above the peat extends beyond the physical boundaries of the site.	•OU2 Work Plan •OU2 SMP •OU2 QAPP •OU2H&S Plan •SOP Monitoring well installation •SOP Monitoring well development •Other related sampling SOPs (Field Parameter Forms)	Installation of monitoring wells and development completed to specified standards including: • Proper calibration procedures • Proper decontamination of equipment • Careful construction on well to design standards • Completion of development to design specifications • Followed standard procedure	•QC Daily inspection checklist (5-1) •QC Audit checklist specific to activity (5-3 and 5-4) •Field logs specific to each applicable SOP	Implementation: •FTL •Field team QC Review: •Task lead	QC audit of each activity by Task Lead. QC audit reviews whether activities follow prescribed procedures and accuracy and completeness of field documentation. Daily QC review by FTL.
Groundwater sampling	Collect groundwater samples and water level measurements to determine if chemical contamination has migrated in groundwater above the peat beyond the physical boundaries of the site.	•OU2 Work Plan •OU2 SMP •OU2 QAPP •OU2H&S Plan •SOP WL and LNAPL thickness measurements •SOP Low-flow groundwater sampling •Other related sampling SOPs (Sample Nomenclature, Chain of Custody Procedures, Field Parameter Forms, Sample Collection, Sample Packaging)	Collection of groundwater samples and water level measurements conducted to specified standards including: • Proper calibration procedures • Proper decontamination of sampling equipment • Careful selection of sampling locations • Proper collection, preservation, identification, and handling of samples • Sample quantities/volume • Followed standard procedure	•QC Daily inspection checklist (5-1) •QC Audit checklist specific to activity (5-5) •Field logs specific to each applicable SOP	Implementation: •FTL •Field team QC Review: •Task lead	QC audit of each activity by Task Lead. QC audit reviews whether activities follow prescribed procedures and accuracy and completeness of field documentation. Daily QC review by FTL.
Sediment sampling	Collect sediment samples to determine if chemical contamination is present in sediment in the drainage swale along the south border of the site following the DOT cleaning activities and also whether the contamination is present in the sediments in the swale downgradient of the site.	•OU2 Work Plan •OU2 SMP •OU2 QAPP •OU2H&S Plan •SOP Sediment sampling •Other related sampling SOPs (Sample Nomenclature, Chain of Custody Procedures, Field Parameter Forms, Sample Collection, Sample Packaging)	Collection of sediment samples conducted to specified standards including: • Proper calibration procedures • Proper decontamination of sampling equipment • Careful selection of sampling locations • Proper collection, preservation, identification, and handling of samples • Sample quantities/volume • Followed standard procedure	•QC Daily inspection checklist (5-1) •QC Audit checklist specific to activity (5-6) •Field logs specific to each applicable SOP	Implementation: •FTL •Field team QC Review: •Task lead	QC audit of each activity by Task Lead. QC audit reviews whether activities follow prescribed procedures and accuracy and completeness of field documentation. Daily QC review by FTL.

Checklists

Checklist 5-1

Diamond Head Oil Superfund Site

Harrison Avenue @ I-280, Kearny, NJ 07032 (Hudson Co.)

Daily Summary - QC Checklist

Today's General Work Activities: _____

The purpose of daily QC checklist is to verify that work is conducted according to procedures in the QAPP, including required documentation.

Refer to the appropriate sections of the QAPP as well as the SOP's and field documentation forms for this activity.

Name of person providing the field report:: _____ Date / Time: _____

Name of Task Lead /PM receiving the report: _____

Specific Work Completed: _____

1) Were specified procedures followed? Yes _____ No _____

If no, describe reason. _____

If no, describe appropriate corrective actions to prevent re-currence _____

2) Was specified documentation completed? Yes _____ No _____

If no, describe reason. _____

If no, describe appropriate corrective actions to prevent re-currence _____

3) Were there any deviations from planned scope? Yes _____ No _____

If yes, describe reason. _____

If yes, describe plan (who, when) for notifying USACE and USEPA _____

4) Were there any exceedances of HASP action levels? Yes _____ No _____

If yes, describe where & possible reason. _____

If yes, describe appropriate corrective actions to prevent re-currence _____

5) Any subcontractor performance / issues _____

6) Site visitors _____

7) Other _____

8) Plans for next day _____

QC Checklist 5-2

Diamond Head Oil Superfund Site

Harrison Avenue @ I-280, Kearny, NJ 07032 (Hudson Co.)

Drilling, Soil Boring Installation and Soil Sampling Activities

The purpose of daily QC checklist is to verify that work is conducted according to procedures in the QAPP, including required documentation.

Refer to the appropriate sections of the QAPP as well as the SOP's and field documentation forms for technical details related to this activity.

Name of person providing the field report: Date:

Name of Task Lead /PM receiving the report:

Summarize Specific Work Performed:

1) Were specified QAPP / SOP / WP procedures followed?	Yes	No	N/A

Drilling	Yes	No	N/A
2) Were subsurface & overhead utilities cleared before commencing drilling?			
3) Were daily equipment and safety checks completed for drilling and associated equipment?			
4) Was safety monitoring equipment (e.g., Multi-gas meter, PID) calibrated and employed throughout drilling?			
5) Did CH2M HILL staff review specific objectives and target depths for each boring prior to commencing?			
6) Were all soil borings grouted and abandoned upon completion?			
7) Were monitoring wells constructed and grouted to seal conduits to subsurface?			
8) Were sampling locations marked sufficiently for reproducibility & survey?			

Soil Borings	Yes	No	N/A
9) Were soil cores and/or soil samples collected as per Work Plan?			
10) Were soil boring logs and sample documentation completed and filed?			
11) Was a PID used to scan soil cores and readings recorded on boring logs?			
12) Was gross contamination (e.g. liquid LNAPL) encountered or other unusual observations?			

Soil Sampling	Yes	No	N/A
13) Were sampling objectives for specific boring locations reviewed prior to commencing?			
14) Were soil samples collected and labeled / documented per QAPP & SOP specifications?			
15) Was sufficient sample volume obtained for all samples?			
16) Were samples placed on ice immediately following collection?			
17) Were additional samples collected based on observation of suspected contamination?			
18) Was sufficient volume collected with VOC EnCore samplers (e.g. manually retract plunger & fill sampler)			
19) Was a separate jar sample collected for VOC % moisture in association with each EnCore sample?			

Explain why any "No" or "N/A" Answers apply:

QC Checklist 5-3

Diamond Head Oil Superfund Site

Harrison Avenue @ I-280, Kearny, NJ 07032 (Hudson Co.)

Monitoring Well Construction

The purpose of daily QC checklist is to verify that work is conducted according to procedures in the QAPP, including required documentation.

Refer to the appropriate sections of the QAPP as well as the SOP's and field documentation forms for technical details related to this activity.

Name of person providing the field report: Date:

Name of Task Lead /PM receiving the report:

Summarize Specific Work Performed:

1) Were specified QAPP / SOP / WP procedures followed? **Yes** **No** **N/A**

Well Construction	**Yes**	**No**	**N/A**
1) Did CH2M HILL staff review specific objectives and target depths for each well prior to commencing?			
2) Were well construction materials clean, factory wrapped and/or pressure washed before use?			
3) Was an appropriate bottom cap / plug installed on the well screen?			
4) Was the well screen slot-size varified before construction			
5) Were the well materials constructed without the use of glues / solvents?			
6) Was the well gravel / sand specification varified, certified clean, and in good/dry condition before use?			
7) Was the grout material specification varified, certified clean, and in good/dry condition before use?			
8) Was sand bridging checked for / cleared during installation of well gravel / sand?			
9) Was the grout material placed in the annular space in lifts by pressure grouting with tremmie pipe?			
10) Was the well annular space grouted the same day to avoid cross-contamination?			
11) Was a water tight compression cap and lock installed on the well?			
12) Was a surface completion finished (e.g, manhole).			
13) Was the well marked with the well ID and NJDEP Well Permit # ?			
14) Were well construction logs completed thoroughly and filed?			
15) Was liquid LNAPL observed in any well?			

Also see the Well Development Checklist

Explain why any "No" or "N/A" Answers apply:

QC Checklist 5-4

Diamond Head Oil Superfund Site

Harrison Avenue @ I-280, Kearny, NJ 07032 (Hudson Co.)

Well Development

The purpose of daily QC checklist is to verify that work is conducted according to procedures in the QAPP, including required documentation.
Refer to the appropriate sections of the QAPP as well as the SOP's and field documentation forms for technical details related to this activity.

Name of person providing the field report: Date:

Name of Task Lead /PM receiving the report:

Summarize Specific Work Performed:

1) Were specified QAPP / SOP / WP procedures followed? **Yes** **No** **N/A**

Well Development	**Yes**	**No**	**N/A**
1) Did CH2M HILL staff review specific objectives for each well prior to commencing?			
2) Was a water quality multi-meter used during development?			
3) Was the water quality multi-meter calibrated prior to use?			
4) Was a separate turbidity meter used and source verified prior to use?			
5) Was the well total depth measured prior to commencing and after completing development?			
6) Was a bailer needed to remove excessive sand from inside the well?			
7) Was a surge block used to surge water through the well screen for at least 15 minutes?			
8) Was a submersible pump used to purge groundwater?			
9) Was development continued until purge water was visually clear ?			
10) Was a colored hue / tint observed in the groundwater following development (explain below)?			
11) Was a chemical / oily / solvent odor noted in the groundwater following development (explain below)?			
12) Was IDW purge water conatinerized and labeled ?			
13) Was a water tight compression cap and lock installed on the well?			
14) Were well development logs completed thoroughly and filed?			
15) Was liquid LNAPL observed in any well?			

Also see the Monitoring Well Construction Checklist

Explain why any "No" or "N/A" Answers apply:

QC Checklist 5-5

Diamond Head Oil Superfund Site

Harrison Avenue @ I-280, Kearny, NJ 07032 (Hudson Co.)

Groundwater Sampling - Water Level Measurements - LNAPL Thickness Measurements

The purpose of daily QC checklist is to verify that work is conducted according to procedures in the QAPP, including required documentation.

Refer to the appropriate sections of the QAPP as well as the SOP's and field documentation forms for technical details related to this activity.

Name of person providing the field report: Date:

Name of Task Lead /PM receiving the report:

Summarize Specific Work Performed:

	Yes	No	N/A
1) Were specified QAPP / SOP / WP procedures followed?			

Groundwater Sampling	**Yes**	**No**	**N/A**
1) Did CH2M HILL staff review specific sampling requirements prior to commencing?			
2) Was dedicated teflon-lined tubing and a decontaminated pump used at each location?			
3) Was a water quality multi-meter used during sampling and calibrated prior to use?			
4) Were low-flow sampling procedures followed?			
5) Did groundwater quality parameters stabilize prior to sampling?			
6) Was the water level / drawdown monitored during purging?			
7) Was the purge rate 200 - 500 ml/min during sampling?			
8) Was adequate volume obtained for all samples (including extra QC volumes)?			
9) Were VOC samples colleced with no bubbles or head space?			
10) Were samples labeled and placed on ice immediately following sampling?			

Water Level & LNAPL Thickness Measurements	**Yes**	**No**	**N/A**
11) Was the well ID verified prior to collecting measurements?			
12) Was an electronic oil-water interface probe used for measurements?			
13) Were "synoptic" measurements collected within the shortest amount of time possible?			
14) Were water levels collected from wells without LNAPL before measuring known LNAPL locations?			
15) Were the probe tip and tape decontaminated between all measuring locations?			
16) Were LNAPL thickness measurements collected from both "top-down" and "bottom-up" ?			
17) Were measurements recorded at the time they were collected?			
18) Were measurements recorded to the hundredth place (x.xx ft) ?			

Explain why any "No" or "N/A" Answers apply:

QC Checklist 5-6

Diamond Head Oil Superfund Site

Harrison Avenue @ I-280, Kearny, NJ 07032 (Hudson Co.)

Sediment Sampling

The purpose of daily QC checklist is to verify that work is conducted according to procedures in the QAPP, including required documentation.

Refer to the appropriate sections of the QAPP as well as the SOP's and field documentation forms for technical details related to this activity.

Name of person providing the field report: Date:

Name of Task Lead /PM receiving the report:

Summarize Specific Work Performed:

	Yes	No	N/A
1) Were specified QAPP / SOP / WP procedures followed?			

Sediment Sampling	Yes	No	N/A
1) Were sampling objectives for specific locations reviewed prior to commencing?			
2) Were samples collected and labeled / documented per QAPP & SOP specifications?			
3) Was sufficient sample volume obtained for all samples (including QC samples) ?			
4) Was sufficient volume collected with VOC EnCore samplers (e.g. manually retract plunger & fill sampler)			
5) Was a separate jar sample collected for VOC % moisture in association with each EnCore sample?			
6) Were samples placed on ice immediately following collection?			
7) Were additional samples collected based on observation of suspected contamination?			
8) Were sampling locations marked sufficiently for reproducibility & survey?			
9) Was a sediment description log documented and filed for each location?			
10) Was a PID used to scan the sediment sample?			
11) Was oil / sheen noted in any sample location?			

Explain why any "No" or "N/A" Answers apply: