Base Realignment and Closure
Program Management Office West
1230 Columbia Street, Suite 1100
San Diego, California 92101

FINAL

SAMPLING AND ANALYSIS PLAN

Revision 0
September 23, 2005

FILTRATION TREATMENT SYSTEM
IR SITE 1 LANDFILL
NAVAL FUEL DEPOT POINT MOLATE
RICHMOND, CALIFORNIA

Base Realignment and Closure
Program Management Office West
1230 Columbia Street, Suite 1100
San Diego, California 92101

CONTRACT NO. N68711-98-D-5713
CTO NO. 0083

FINAL

SAMPLING AND ANALYSIS PLAN
(Field Sampling Plan and Quality Assurance Project Plan)
Revision 0
September 23, 2005

FILTRATION TREATMENT SYSTEM
IR SITE 1 LANDFILL
NAVAL FUEL DEPOT POINT MOLATE
RICHMOND, CALIFORNIA

DCN: FWSD-RAC-05-1772

TETRA TECH EC, INC.
1230 Columbia Street, Suite 500
San Diego, CA 92101

Mary Schneider — 9/16/05
Mary Schneider, Date
Quality Control Program Manager

Narciso A. Ancog — 9/16/2005
Narciso A. Ancog, Date
NAVFAC SW Quality Assurance Officer

TETRA TECH EC, INC.

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Southwest Division
Ms. Beatrice Appling, AQE.BA
1220 Pacific Highway
San Diego, CA 92132-5190

DATE: 09/23/05
CTO: 0083
LOCATION: Point Molate

FROM: Edwin Neil Hart
Neil Hart, Program Manager

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J. Kowalczyk (06CM.JK)	M. Schneider	
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ABBREVIATIONS AND ACRONYMS

%R	percent recovery
µg/L	micrograms per liter
BRAC	Base Realignment and Closure
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
COC	chain-of-custody
CTO	Contract Task Order
DON	Department of the Navy
DQO	data quality objective
EDD	electronic data deliverable
EPA	U.S. Environmental Protection Agency
EWI	Environmental Work Instruction
GC/MS	gas chromatograph/mass spectrometer
HCL	hydrochloric acid
IR	Installation Restoration
mL	milliliter
N/A	not applicable
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
NE	none established
NFD	Naval Fuel Depot
OWS	oil/water separator
QC	quality control
RAO	Remedial Action Objective
RL	reporting limit
RPD	relative percent difference
SAP	Sampling and Analysis Plan
Sullivan	Sullivan Consulting Group
TPH	total petroleum hydrocarbons
TtEC	Tetra Tech EC, Inc.
TtFW	Tetra Tech FW, Inc.
VOA	volatile organic analysis
VOC	volatile organic compound

1.0 INTRODUCTION

This abbreviated Sampling and Analysis Plan (SAP) describes sampling and analysis to support a remedial action at Installation Restoration (IR) Site 1, at Naval Fuel Depot (NFD) Point Molate, located in Richmond, California. Tetra Tech EC, Inc (TtEC) prepared this SAP on behalf of the Department of the Navy (DON), Base Realignment and Closure (BRAC) Program Management Office West under Contract No. N68711-98-D-5713, and Contract Task Order (CTO) No. 0083. The sampling efforts to be conducted under this SAP address minimal sampling in support of the start-up of a new filtration treatment system at the site. The filtration treatment system is being installed in accordance with the Remedial Design Work Plan [Tetra Tech FW, Inc. (TtFW) 2005] also prepared under this CTO.

1.1 OBJECTIVES

This abbreviated SAP describes the sampling activities in support of start-up of the planned filtration treatment system. Samples collected and analyzed under this SAP are for DON informational purposes only. This sampling is not being performed to fulfill any regulatory or permitting requirement. The samples will be collected with the following objectives in mind:

1. To obtain a general understanding of the efficiency or effectiveness of the treatment system. Under the right circumstances, this sampling could help validate the usefulness and effectiveness of the system. However, it cannot be guaranteed that this objective will be met. For instance, insufficient contaminant concentration may be present in the system influent at the time of start-up to adequately measure system removal efficiency.

2. To provide a basis for optimizing the system. Again, information obtained during sampling may or may not be sufficient to meet this objective.

3. To provide a baseline for future evaluation or troubleshooting of the system (if necessary).

4. To provide characterization of any water that is collected during start-up activities.

1.2 BACKGROUND

This remedial action is being conducted in accordance with the requirements of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). Since this remedial action is being performed in accordance with Section 121(e) of CERCLA, no local permits are necessary. However, all substantive requirements will be met, and close coordination with the City of Richmond will be maintained to ensure satisfactory compliance with this interface.

Based on the site's operational history and site-specific investigative data [Sullivan Consulting Group (Sullivan), 2004], the DON has determined that this site contains chemical contamination in effluent from the oil/water separator (OWS) installed at the IR Site 1 landfill requiring a response action. This decision is documented in the *Record of Decision, Installation Restoration Site 1, Naval Fuel Depot Point Molate, Richmond, California* (DON, 2005).

The DON has initiated this remedial action for the installation of a filtration treatment system at the IR Site 1 landfill to address dissolved phase total petroleum hydrocarbons (TPH) in the OWS effluent. TPH is the only contaminant of concern associated with this project. This remedial action will serve to eliminate the potential threat posed by future migration and/or off-site release of these contaminants to the surrounding environment. The planned remedial action at IR Site 1 incorporates the installation of a filtration treatment system, start-up, and demobilization.

1.3 MAPS

The figure relevant to the proposed sampling locations is as follows:

- Figure P-001, Filtration Treatment System Piping and Instrumentation Diagram

2.0 SAMPLING AND ANALYSIS

The following sections described the sampling strategy and analysis requirements for this project.

2.1 SAMPLING STRATEGY

During system start-up, samples will be collected from the water that is being processed through the system. The water source is a discharge from a seep outfall at the landfill. The water flows through the system in accordance with the piping and instrumentation diagram (Figure P-001).

In accordance with the Work Plan (TtFW, 2005), during initial start-up, water that has been processed through the system will be collected in a temporary Baker tank located on site. Once a steady flow has been established through the system (with collection in the Baker tank), one sample will be collected from each of the following three locations:

1. Prior to the OWS at sampling port SP-104 (influent)
2. Between the OWS and the equalization tank at sampling port SP-105 (post-OWS)
3. After all treatment equipment at sampling port SP-155 (effluent)

These samples will only be analyzed for TPH as diesel. TPH as diesel is the only analyte (with a Remedial Action Objective- RAO) that has exceeded any RAO during the course of effluent sampling and has driven the decision to install this system.

Although this SAP is written to address only one initial start-up sample at each location, additional informational samples to assist with system optimization or evaluation may be collected. Further samples, if necessary, will be taken in accordance with the procedures outlined in this SAP.

Once the Baker tank is at 70 percent capacity, collection in the Baker tank will cease, and direct discharge from the system will commence. Sample results may or may not be available at this point. Sample results will not be used to determine whether or not direct discharge from the system will commence. The Baker tank is only used during start-up to guard against any upset condition during installation or initial start-up from being inappropriately discharged. In general, engineering judgment and visual observation will be used to determine that the system is running smoothly and is in appropriate condition to begin normal discharge. The Baker tank will be used up to 70 percent capacity to ensure that the system is appropriately flushed prior to commencing direct discharge.

If the results show that the effluent concentration of TPH-diesel is above the numerical Remedial Action Objective (RAO) of 640 micrograms per liter (µg/L), further evaluation of the site and

system (as well as additional sampling and analysis) may be necessary. This situation is not anticipated; however, in the unlikely event that this situation was to occur, the DON would be consulted prior to taking any further action.

Once collection in the Baker tank is complete, one sample will be collected from the tank to characterize the water for disposition and analyzed for TPH-diesel. If the results show that TPH-diesel is below the RAO (640 µg/L) and the water in the tank is not significantly turbid, the water will be directly discharged back through the system (fed to the equalization tank) and directly discharged. If the results show TPH-diesel above this level, the water will be characterized and disposed of at an approved off-site treatment and disposal facility in accordance with existing project waste management procedures described in the Work Plan (TtFW, 2005). Additional analytical testing, as required for disposal, may be performed as necessary.

2.2 ANALYTICAL METHODS

U.S. Environmental Protection Agency (EPA) Method 8015B [*Test Methods for Evaluating Solid Waste, Physical Chemical Methods, SW-846*, Third Edition and final updates (EPA, 1986)] will be used to analyze samples for TPH as diesel during this project.

2.3 SAMPLE CONTAINERS, PRESERVATIVES, AND HOLDING TIMES

A list of the sample containers, preservatives, and holding time requirements for TPH analysis is as follows:

Analyte	Analytical Method	Container	Preservative	Holding Time
TPH (diesel)	EPA Method 8015B	Two 1-liter glass ambers	Cool, 4±2°Celsius	7 days to extraction and 40 days to analyze

2.4 FIELD QUALITY CONTROL SAMPLES

The objective of this sampling is not for any regulatory or permitting requirements; however, field duplicates will be collected as field quality control (QC) samples.

Field duplicates consist of two distinct samples (an original and a duplicate) of the same matrix collected at the same time and location to the extent possible and using the same sampling techniques. The purpose of field duplicates is to measure the consistency of field sampling. Field duplicates will be collected at a frequency of one for every ten samples taken and will be analyzed for the same analytes as the original sample. Field duplicates are uniquely identified so that the identity of the field duplicates is "blind" to the analytical laboratory. Exact locations of field duplicate samples and their identifications will be recorded in the field logbook.

2.5 SAMPLING PROCEDURES

Samples will be collected from each port described in Section 2.1 by opening the port and filling up the containers described in Section 2.3. The one-liter containers will be filled completely. All sample containers will be numbered, labeled, and packaged in accordance with Sections 3.1, 3.2, and 3.4. Field documentation, including field logbooks and chain-of-custody (COC) records, will be filled out in accordance with Section 3.3. Specifically, field personnel will record any observations in the field logbook including the percentage of any free-phase product present in the sample containers.

Samples collected from the Baker tank will be done using a disposable bailer or equivalent. Sample containers will be filled as described above.

3.0 DOCUMENTATION

This section describes the documentation requirements for this project.

3.1 SAMPLE NUMBER

Each sample will be identified by a 5-digit number (YY-YYY-ZZZ) as follows:

XX:	2-character designation of the CTO number (for example, 83)
YYY	3-character designation of the site name (for example, IR1)
ZZZ:	3-character designation of the consecutive sample number (for example, 004)

For example, in the sample identification number 84-IR1-004, "84" represents the CTO number, IR1 represents the site name, and "004" represents the fourth sample collected for the project.

The sample number will be recorded in the field logbook, on the labels, and COC record at the time of sample collection. A complete description of the sample and sampling conditions will be recorded in the field logbook and referenced using the unique sample identification number.

3.2 SAMPLE LABELING

Sample labels are necessary to prevent misidentification of samples. Sample labels will be filled out in indelible black or blue ink and affixed to sample containers at the time of sample collection. Each sample label will be covered with clear tape. Each sample container will be labeled with the following, at a minimum:

- Sample identification number
- Sample collection date (month/day/year)
- Time of collection (24-hour clock)
- Sampler's initials
- Analyses required
- Preservative (if any)

3.3 FIELD DOCUMENTATION

In order to maintain the integrity and traceability of samples, all information pertinent to field sampling will be recorded in a field logbook. Samples will be properly labeled and custody-sealed prior to being transported to the laboratory and will be accompanied by completed COC documentation. Associated documentation will be recorded in indelible black or blue ink.

3.3.1 Chain-of-custody

To establish the documentation necessary to trace sample possession from the time of collection through analysis, a COC record will be completely filled out during sample collection and will accompany every sample.

3.3.2 Custody Seals

Sample custody seals are used to detect unauthorized tampering of samples from the time of sample collection to the time of analysis.

The seals will be signed or initialed and dated by the sampler. The seals will be placed on the sample containers and shipping containers in such a way that they must be broken in order to open the containers. Seals will be affixed to containers before the samples leave the custody of the sampling personnel.

3.3.3 Field Logbooks

A permanently bound field logbook with consecutively numbered pages, used for sampling activities only, will be assigned to this project. Entries will be recorded in indelible black or blue ink. At the end of each workday, the logbook pages will be signed by the responsible sampler, and any unused portions of the logbook pages will be crossed out, signed, and dated.

If it is necessary to transfer the logbook to another person, the person relinquishing the logbook will sign and date the last page used, and the person receiving the logbook will sign and date the next page to be used.

At a minimum, the logbook will contain the following information:

- Project name and site location
- Date and time
- Personnel in attendance
- General weather information
- Work performed
- Field observations
- Sampling performed, including specifics such as location, type of sample, type of analyses, and sample identification
- Field analyses performed, including results, instrument checks, problems, and calibration records for field instruments
- Descriptions of deviations from this SAP

- Problems encountered and corrective action taken
- Identification of field QC samples
- QC activities
- Verbal or written instructions
- Any other events that may affect the samples

3.3.4 Document Corrections

Changes or corrections on project documentation will be made by crossing out the erroneous item with a single line and initialing (by the person performing the correction) and dating the correction. The original item, although erroneous, must remain legible beneath the cross-out line. The new information should be entered legibly and in a way to clearly correspond to the crossed-out item.

3.4 SAMPLE PACKAGING AND SHIPMENT

Immediately after sample labeling, custody seals will be affixed to each sample container. Each container will be placed in double-resealable plastic bags to protect the samples from moisture.

Samples will be shipped in coolers with sufficient ice to keep the samples at 4±2 °Celsius. Each cooler will be shipped with a temperature blank. A temperature blank is a container filled with tap water and stored in the cooler during sample collection and transportation. The temperature of the cooler will be recorded by the laboratory on the COC record immediately upon receipt of the samples. Sample cooler drain spouts will be taped from the inside and outside of the cooler to prevent any leakage.

Two custody seals will be taped across the cooler lid: one seal in the front and one seal in the back. The COC record will be completed and signed by the courier. The cooler(s) and the top two copies (white and pink) of the COC record will then be released to the courier for transportation to the laboratory. Samples to be shipped by commercial carrier will be packed in a sample cooler lined with a plastic bag. (All glass sample containers will be protected with bubble wrap, and then placed in resealable bags if transported by a commercial carrier.) Double-bagged ice will be added inside the plastic bag at the bottom of the cooler, one layer of sample containers will be placed on the ice, and more double-bagged ice will be placed on top of the containers. This will be repeated until the cooler is filled with ice as the top layer in the cooler. The COC record will include the airbill number, and the "Received By" box will be labeled with the commercial courier's name. The top two copies of the COC record will be sealed in a double-resealable bag and then taped to the inside of the sample cooler lid. The cooler will be taped shut with strapping tape. Two custody seals will be taped across the cooler lid: one seal in the front and one seal in the back. Clear tape will be applied to the custody seals to prevent accidental

breakage during shipment. The pouch for the airbill will be placed on the cooler and secured with clear tape. The airbill will be completed for priority overnight delivery and placed in the pouch. If multiple coolers are being shipped, the original airbill will be placed on the cooler with the COC record, and copies of the airbill will be placed on the other coolers. The number of packages should be included on each airbill (1 of 2, 2 of 2). Saturday deliveries should be coordinated with the laboratory in advance, and field sampling personnel or their designee must ensure that Saturday delivery stickers are placed on each cooler by the commercial courier. "Dangerous goods" declarations will also be completed as applicable.

4.0 QUALITY ASSURANCE AND QUALITY CONTROL OBJECTIVES

The DQOs associated with environmental data are a function of the sampling plan rationale and the procedures used to collect the samples, as well as the analytical methods and instrumentation used. However, uncertainty cannot be eliminated entirely from environmental data.

4.1 DATA QUALITY OBJECTIVES

The DQO process is a seven-step planning approach based on scientific methods that are designed to ensure that the type, quantity, and quality of environmental data used for decision making are appropriate for the intended application. The DQOs are as follows:

Step 1: State the Problem

Evaluate filtration treatment system performance.

Step 2: Identify the Decision

Are the effluent results above the RAO?

Step 3: Identify Inputs to the Decision

- Previous data including monitoring of the OWS discharge prior to installation of the filtration treatment system
- Influent, post-OWS, and effluent concentrations during sampling for this project

Step 4: Define the Boundaries

Influent concentration, post-OWS concentration, and effluent concentration at the time of start-up

Step 5: Develop a Decision Rule

- If the effluents results are above the RAO of 640 µg/L, further evaluation of the site and system (as well as additional sampling and analysis) may be necessary. This situation is not anticipated; however, in the unlikely event that this situation was to occur, the DON would be consulted prior to taking any further action. Otherwise, the post-OWS and influent results will be compared with the effluent results to determine the effectiveness of the addition of the filtration system.

Step 6: Specify Limits on Decision Errors

Due to judgmental sampling design, decision errors will not be established.

Step 7: Optimize the Sampling Design

The samples from the influent, post-OWS, and effluent will be collected and analyzed for TPH. Additional samples may be collected as required.

4.2 ANALYTICAL DATA QUALITY OBJECTIVES

Analytical data will be obtained using published, standard methods in a state of California Department of Health Services-certified and Naval Facilities Engineering Service Center-evaluated laboratory. The analytical methods used, proposed reporting limits (RLs), and project QC criteria are also detailed in this document.

4.2.1 Proposed Reporting Limits

Proposed RLs for this project are presented in Table 4-1.

4.2.2 Project Quality Control Limits

The precision and accuracy QC limits for each method are presented in Table 4-2.

4.3 DELIVERABLES

The following sections describe the deliverable documents that will be submitted to TtEC by the analytical laboratory.

4.3.1 Hard-copy Deliverables

Two copies of the hard-copy data will be submitted to TtEC by the laboratory. The report pages will be sequentially numbered. The report will contain a table of contents referencing individual sections in the data package, original white copy of COC records, a copy of all corrective action reports, and a narrative documenting the resolution of all corrective actions and nonconformances. All TtEC samples will be cross-referenced to the associated QC samples. When revisions to data reports are required, the revised pages will be stamped with the notation "amended or revised report."

For all samples, 100 percent of the data will be submitted in an EPA Level III-equivalent data package. All data packages will be assembled in the following sequence:

- Cover page (with laboratory service identification number, TtEC project name, and TtEC project number)
- Original COC records (including cooler temperature and sample condition)
- Sample receipt forms
- Cross-reference table

- Case narrative
- Organic raw data sequence (by test):
  - Sample result forms, including method blanks
  - Sample raw data after each result form (EPA Level IV only)
  - Surrogate summaries (surrogate results may appear on the sample result forms)
  - QC summaries including internal standards, LCS, MS/MSD (raw data for EPA Level IV only)
  - Tune data [gas chromatograph/mass spectrometer (GC/MS) only]
  - Initial calibration
  - Daily calibration checks, including related continuing calibration verification
  - Resolution check standards (GC/MS and pesticides) (if applicable)
  - Instrument run log
  - Sample preparation log

4.3.2 Electronic Deliverables

The electronic data deliverable (EDD) will be in ASCII format. This will be compatible with the Naval Electronic Data Deliverable standard as described in *Environmental Work Instruction (EWI) EVR.6, Environmental Data Management and Required Electronic Delivery Standards* (Southwest Division, Naval Facilities Engineering Command, 2005). The laboratory will verify that the EDD and the hard-copy reports are identical. Both the EDD and the hard-copy report will present results to two or three significant figures. For organic results, two significant figures will be used for all results. Results for QC analyses (method blanks, MS/MSD, LCS, and duplicates) will be reported up to three significant figures. The EDD for each sample delivery group is due at the same time as the hard-copy report, 21 calendar days after the last sample of the sample delivery group has been delivered to the laboratory.

5.0 REFERENCES

Department of the Navy (DON). 2005. *Record of Decision, Installation Restoration Site 1, Naval Fuel Depot Point Molate, Richmond, California.*

Southwest Division, Naval Facilities Engineering Command. 2005. *Environmental Work Instruction (EWI) EVR.6, Environmental Data Management and Required Electronic Delivery Standards.* April.

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Tetra Tech FW, Inc. (TtFW). 2005. *Draft Remedial Design Work Plan.* IR Site 1 Landfill, Naval Fuel Depot Point Molate. June 30.

U.S. Environmental Protection Agency (EPA). 1986. *Test Methods for Evaluating Solid Waste, Physical Chemical Methods, SW-846.* Third Edition and final updates.

TABLES

TABLE 4-1

PROPOSED REPORTING LIMITS

Parameter/Method	Analyte	Water		
		RL	Unit	RAO
TPH/EPA Method 8015B	TPH-Diesel (C10-C24)	50	µg/L	640

Notes:

µg/L – microgram per liter
EPA – U.S. Environmental Protection Agency
RAO – Remedial Action Objective
RL – reporting limit
TPH – total petroleum hydrocarbons

TABLE 4-2

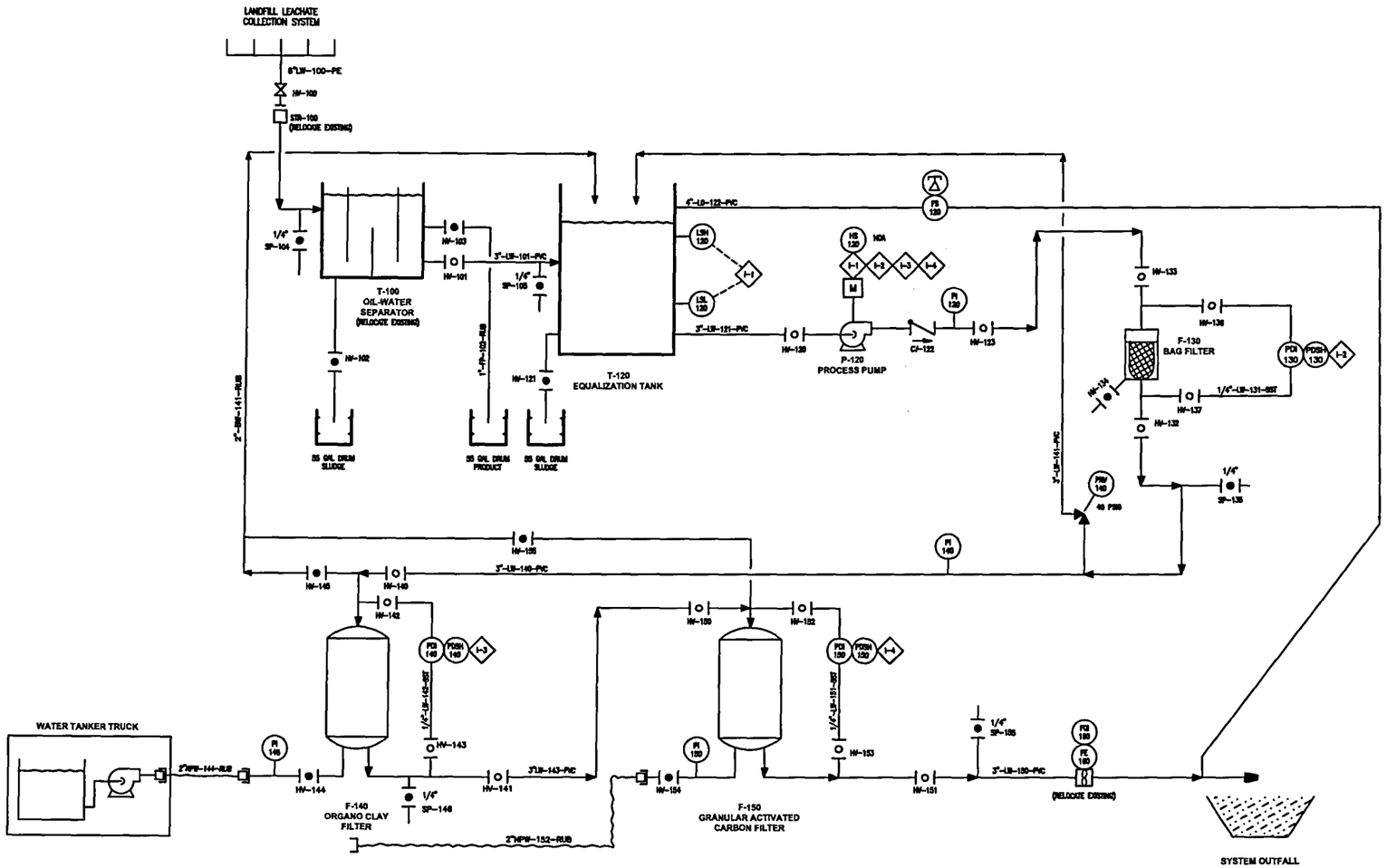
QUALITY CONTROL ACCEPTANCE CRITERIA

Method	Analyte	Accuracy Water (%R)	Precision Water (RPD)
EPA Method 8015B	TPH	65-135	≤ 30
	Surrogate (choose one):		
	Octacosane/hexacosane/ bromofluorobenzene	65-135	N/A

Notes:

%R – percent recovery
EPA – U.S. Environmental Protection Agency
N/A – not applicable
RPD – relative percent difference
TPH – total petroleum hydrocarbons

FIGURES



LEGEND:

- GATE VALVE
- BALL VALVE
- CHECK VALVE
- BUTTERFLY VALVE
- PRESSURE RELIEF VALVE
- MOTOR
- CENTRIFUGAL PUMP
- BASKET STRAINER
- BAG FILTER
- FLOWMETER
- CAM AND GROOVE HOSE FITTING
- DIFFUSER
- AUTODIALER
- LOCALLY MOUNTED
- INTERLOCK

ABBREVIATIONS:

BW	BACKWASH WATER
FE	FLOW ELEMENT
FP	FREE PRODUCT
FQI	FLOW INDICATOR/TOTALIZER
FS	FLOW SWITCH
HV	HAND VALVE
HOA	HAND-OFF-AUTO SWITCH
LW	LEACHATE WATER
LO	LEACHATE OVERFLOW
NPW	NON-POTABLE WATER
PI	PRESSURE GAUGE
PDI	PRESSURE DIFFERENTIAL INDICATOR
PDSH	PRESSURE DIFFERENTIAL SWITCH
PRV	PRESSURE RELIEF VALVE
PVC	POLYVINYL CHLORIDE
RUB	RUBBER
SP	SAMPLE PORT
SST	STAINLESS STEEL TUBING

BASE REALIGNMENT AND CLOSURE
PROGRAM MANAGEMENT OFFICE WEST
SAN DIEGO, CA

FIGURE P-001
FILTRATION TREATMENT SYSTEM PIPING AND INSTRUMENTATION DIAGRAM
NAVAL FUEL DEPOT POINT MOLATE
RICHMOND, CALIFORNIA

TETRA TECH EC, INC.

DRAWING NO: 051772P001.DWG
DCN: FWSD-RAC-05-1772
CTO 0083
APPROVED BY: KW
CHECKED BY: LB
REV: 0
DRAWN BY: NPF
DATE: 09/23/05

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