QUALITY ASSURANCE SAMPLING PLAN

FOR

Ector Drum Site

Removal Support

Odessa, Ector County, Texas

Prepared For

U.S. Environmental Protection Agency Region 6
1445 Ross Ave.
Dallas, Texas 75202

Prepared by

CSS-Dynamac
1323 Columbia Drive, Suite 307
Richardson, Texas 75081

Date Prepared	May 15, 2015
CERCLIS Number	TBD
TDD Number	1/DYNAMAC-077-15-001
Contract Number	EP-W-06-077
START-3 Project Manager	Noel Biscocho
Telephone No.	214-575-3344
U.S. EPA On-Scene Coordinator	Bill Rhotenberry Mike McAteer

QUALITY ASSURANCE SAMPLING PLAN

FOR

Ector Drum Site

Removal Support

Odessa, Ector County, Texas

Prepared For

U.S. Environmental Protection Agency Region 6
1445 Ross Ave.
Dallas, Texas 75202

Prepared by

CSS-Dynamac
1323 Columbia Drive, Suite 307
Richardson, Texas 75081

May 15, 2015

APPROVALS

CSS-Dynamac

Noel Biscocho
START-3 Project Manager

U.S. Environmental Protection Agency

Bill Rhotenberry
On-Scene Coordinator

CSS-Dynamac

Debra Pandak
START-3 Program Manager

U.S. Environmental Protection Agency

Mike McAteer
On-Scene Coordinator

TABLE OF CONTENTS

TABLE OF CONTENTS
(Continued)

FIGURES

TABLES

APPENDICES

1.0 INTRODUCTION

CSS-Dynamac Superfund Technical Assessment and Response Team (START-3) has been tasked by the U.S. Environmental Protection Agency (EPA), Region 6, under Technical Direction Document (TDD) # 1/DYNAMAC-077-15-001, to collect samples in support of the Removal activities to be conducted at the Ector Drum Site, located at 2604 N. Marco Ave., Odessa, Ector County, Texas (TX).

The focus of this investigation is to collect surface soil and waste samples at the site to determine the presence of hazardous substances and document whether site conditions present an imminent and substantial endangerment to human health and the environment. This quality assurance sampling plan (QASP) is prepared in partial fulfillment of the TDD. This QASP is designed to guide field operations during the collection of soil and waste (sludge and/or liquid) samples and to describe the quality assurance/quality control (QA/QC) measures and procedures that will be implemented during field work.

1.1 OBJECTIVES

The objective of this project, per EPA OSC, is as follows:

- Collect soil and waste (sludge or liquid) on-property to determine the presence or absence of hazardous substances.
- Document site conditions to determine the potential of offsite migration of hazardous substances.

To accomplish the above-mentioned objectives, START will collect up to ten (10) surface soil samples from locations identified by the EPA OSC's; and collect up to four (4) waste samples (sludge or liquid) from drums or tote-containers located on-property.

2.0 SITE BACKGROUND

2.1 Site Location and Owner

Ector Drum Site is a former drum reconditioning facility located at 2604 N. Marco Ave., Odessa, Ector County, Texas (TX). Geographic coordinates for the site (obtained via Google Earth), from the on-property office, are: 31.885702º N latitude and -102.294767º

W longitude (Figure 1). The approximate size of the property (measured from Google Earth) is 4.53 acres or 197,333.5 square feet (sq. ft.).

The site is situated in an urban setting, with industrial, commercial, and residential properties located within a 1/8 mile radius of the property (Figure 2). Ector Drum site is in the northeast corner of N. Marco Ave and E. Market St., and is surrounded by commercial/industrial properties (Figures 1 and 2).

The property appears to be bordered by a chain link fence. However, a Texas Commission on Environmental Quality (TCEQ) Investigation Report on 7/25/14 reported that there were numerous openings throughout the fence line (Appendix A).

Ector Drum is an abandoned facility owned by Mr. Randy Beard.

2.2 Site History

There is very little data pertaining to past operations. The date when operations began is not currently known. The date the site was abandoned is not known; however, the site was inactive and abandoned on July 25, 2014, when the TCEQ conducted an investigation at the site. The TCEQ investigation was the result of a complaint received by the TCEQ Region 7 office in Midland, TX on June 23, 2014. The complaint alleged that contaminated storm water was being discharged from the facility. The site visit conducted on July 25, 2014 indicated that numerous 55-gallon metal and plastic drums and 350-gallon tote-containers full of unknown chemicals existed at the facility. The TCEQ inspectors noted many stained soil areas throughout the site. Two waste above-ground storage tanks (ASTs), designated as Fac 001 and Fac 002, were observed within a concrete secondary containment vault. AST Fac.001 had an estimated total capacity of 200 barrels (bbls) and the AST Fac. 002 had an estimated total capacity of 160 bbls. The TCEQ inspectors noted that the secondary containment vault contained a mixture of water and unknown chemical. Approximately 6 to 8 inches of freeboard remained in the secondary containment vault.

On October 8, 2014, a contractor for TCEQ located the on-site drinking water well (Appendix B). Using an interface probe to gauge the well for the presence of Phase Separated Hydrocarbons (PSHs), 1.8 feet of PSHs existed in the well bore. The investigators believed that the PSH (oil) migrated into the well casing through an electric conduit. The source of the oil is believed to be surface water runoff impacted by releases

of oil from drums/containment areas located at the site. The TCEQ contractors built a small concrete berm around the drinking water well to prevent additional impacts from future rainfall events. Two samples were collected from the on-site drinking water well: an oil-phased sample and a water-phased sample. Both samples were submitted to a laboratory for total metals (EPA Method 6010), volatile organic compounds (VOCs) using EPA Method 8260, semi-volatile organic compounds (SVOCs) using EPA Method 8270, and Total Petroleum Hydrocarbons (TPH) using TX Method 1005 and 1006. Inorganic chemical analysis of the oil-phased groundwater sample indicated concentrations of arsenic (2.46 milligrams per liter [mg/L]), chromium (33.1 mg/L), copper (5.0 mg/L), lead (3.34 mg/L), nickel (2.92 mg/L) and zinc (274 mg/L), all of which exceeded the TCEQ Risk Reduction Program (TRRP) Tier I, Residential Groundwater Protective Concentration Levels (PCLs). Organic chemical analysis of the oil-phased groundwater sample indicated the presence of benzene at 2.90 mg/L, which exceeded the TRRP Tier 1 Residential Groundwater PCLs. Due to dilution factor of 1000, there were no other VOCs or SVOCs detected above the detection limit. TPH analysis (TX 1005) of the oil-phased groundwater sample indicated 533,000 mg/L. TPH analysis (TX1006) indicated exceedances of the TRRP Tier I, Residential Groundwater PCLs for aliphatic hydrocarbons in the C12-16, C16-C21, and C21-35 range.

Inorganic analysis of the water-phased groundwater sample indicated concentrations of chromium (0.298 mg/L), mercury (0.00211 mg/L) and zinc (7.41 mg/L) exceeding the TRRP Tier 1 Residential Groundwater PCLs. Organic chemical analysis did not detect the presence of VOCs and SVOCs in concentrations exceeding the TRRP Tier 1 Residential Groundwater PCLs. TPH analysis (TX1005) indicated 274 mg/L of TPH in the water-phase groundwater sample.

3.0 FIELD OPERATIONS

3.1 CONCEPT OF OPERATIONS

3.1.1 Schedule

A site walk-through with the EPA OSCs, TCEQ Representatives and START-3 team is scheduled on May 19, 2015. The field work and sample packaging is scheduled to commence on May 20, 2015, and is anticipated to require approximately 1 day for

completion. Samples are to be packaged and hand-delivered to Xenco laboratory on May 20, 2015.

Preliminary laboratory analytical results are anticipated to be received by START-3 within five (5) business days of sample receipt by the laboratory. The final laboratory analytical report package is anticipated to be received within 10 business days.

3.1.2 Health and Safety

Field activities will be conducted in accordance with EPA Standard Operating Procedures (SOPs), the Generic QAPP, and a site-specific Health and Safety Plan (HASP).

3.1.3 Site Access and Logistics

The EPA OSCs will obtain site access from the current site owner. All activities will be coordinated with the EPA OSCs and TCEQ.

3.2 SAMPLING DESIGN

Table 1 presents the estimated number of samples, location descriptions, and laboratory analyses. The sampling design includes the collection of samples at one (1) to ten (10) soil locations on-site, and one (1) to four (4) waste samples (liquid or sludge) from one (1) to four (4) selected drums and/or tote-containers. Dedicated sampling equipment will be used wherever possible in an effort to eliminate any potential cross contamination concerns. All sampling activities will be documented in a logbook and photographed in accordance with EPA ERT SOP #2002 (Appendix E).

Samples will be packaged and hand-delivered to Xenco Laboratory in Odessa, Texas. Laboratory analytical methods are specified in Table 2.

3.2.1 Soil Sampling

START will collect soil samples from one (1) to ten (10) locations as specified by the EPA OSC and selected during the walk-through. Grab samples will be collected at a depth of approximately 0 to 6 inches below ground surface using a stainless steel spoon or trowel, per the procedures in ERT SOP 2012 Soil Sampling (Appendix C). Soil VOC sample aliquots will be collected in 5 gram zero-headspace Encore™ sampling devices. Sample containers are listed in Table 2. The surface soil

samples collected will be sequentially labeled with the site, type of sample and number, e.g., ED-S01 = Ector Drum soil sample 01.

The samples will be shipped to the appropriate laboratory for chemical analysis for Target Compound List (TCL) VOCs, SVOCs, Pesticides, PCBs, Target Analyte List (TAL) Total Metals (including mercury and cyanide), and TPH by TX 1005 method.

All sampling activities will be documented in a logbook and photographed.

3.2.2 Waste Sampling

START will collect waste samples (liquid or sludge) from one (1) to four (4) containers (tote, or 55-gal steel or poly drum) located on-property. Table 1 presents the anticipated number of container samples, location descriptions, and proposed laboratory analyses. Dedicated sampling equipment will be used wherever possible in an effort to eliminate any potential cross contamination concerns.

The container samples will be collected according to ERT SOP 2009 Drum Sampling (Appendix D). The container samples collected will be sequentially labeled with the site, type of sample and number, e.g., ED-WS01 = Ector Drum Waste Sludge 01; ED-WL01 = Ector Drum Waste Liquid 01.

The container samples will be shipped to the appropriate laboratory for chemical analysis for TCLVOCs, SVOCs, Pesticides, PCBs, TAL Total Metals (including mercury and cyanide), flashpoint (liquid samples only), TPH by TX 1005 methodology.

In addition, START may collect container samples for hazard categorization. Hazard categorization will include the use of SPILFYTER strips to test for pH, the presence of an oxidizing risk, the presence of a fluoride risk, the presence of an organic solvent in a petroleum compound, the presence of iodine, bromide, and chloride risks. In addition, flammability risk will be determined on the collected liquid waste samples.

All waste sampling and hazard categorization activities will be documented in a logbook and photographed.

3.3 SAMPLE LOCATIONS

Soil and waste samples will be collected on-property at locations determined during the site walk-through with the EPA OSCs and START-3 on May 19, 2015.

3.4 SAMPLE COLLECTION

3.4.1 Soil Sampling

Grab samples will be collected at a depth of approximately 0 to 6 inches below ground surface, using stainless steel spoons or trowels, per the procedures in ERT SOP 2012 Soil Sampling (Appendix C). Soil VOC sample aliquots will be collected in 5 gram zero-headspace Encore™ sampling devices. The sample will be transferred to sample containers. After retrieval, the samples will be labeled, entered into the SCRIBE database, printed onto a SCRIBE-generated chain-of custody form, and placed in a cooler, sealed, and shipped to the laboratory for analysis.

3.4.2 Waste Sampling

Waste samples (liquid) will be collected using either a drum thief from an opening of a tote-container or 55-gallon drum. Waste samples (sludge) will be collected using a glass beaker from an opening of a tote or 55-gallon drum or from a stainless steel trowel or spoon. The samples will be collected according to ERT SOP 2009 Drum Sampling (Appendix D).

After retrieval, the samples will be labeled, entered into the SCRIBE database, printed onto a SCRIBE-generated chain-of custody form, and placed in a cooler, sealed, and shipped to the laboratory for analysis.

3.5 CONTROL OF CONTAMINATED MATERIALS

Any investigation derived waste (IDW) generated through sampling operations will be contained in accordance with EPA ERT SOP 2049 Investigation-Derived Waste Management (Appendix F). It is anticipated that IDW will consist of used PPE and used sampling equipment which does not require special disposal requirements. Upon OSC direction, the generated IDW will be double-bagged and left on-property until the Removal begins. At that time, the Emergency Response and Remedial Services (ERRS) contractor will dispose of the generated IDW at a state-permitted and licensed disposal facility.

3.6 ANALYTICAL PARAMETERS

The analytical methods are specified in Table 2.

4.0 QUALITY CONTROL

4.1 LABORATORY QUALITY CONTROL

Specific QC criteria have been developed to ensure that the Data Quality Objectives (DQOs) are met. Analytical methods for sample analysis have been selected on the basis of the required detection limits, known contaminants existing in the study area, and the range of analytes to be determined. Table 2 of this text presents method numbers and reference guidance, sample containers, sample volume requirements, sample preservatives, and holding times.

4.2 FIELD QUALITY CONTROL

All samples will be handled and preserved as described in CSS-Dynamac SOPs. It is anticipated that all sampling equipment will be dedicated.

4.3 CHAIN OF CUSTODY

After the samples have been collected, the sampling data (station number, time collected, sampler, GPS coordinates, etc.) will be entered into U.S. EPA SCRIBE Enterprise software. SCRIBE Enterprise will be used to generate sample labels and Chain-of-Custody (COC) forms for the collected samples to be shipped to the laboratory for chemical analysis. In addition, SCRIBE Enterprise will serve as the sampling and analytical result database for all the samples collected during the sampling event. All COCs will be completed according to the EPA ERT SOP #2002 (Appendix E).

5.0 RECONCILIATION WITH DATA QUALITY OBJECTIVES

The data will be assessed for accuracy, precision, completeness, representativeness, and comparability. Data assessment criteria are presented in the START-3 Generic QAPP, Section 4.0 “Assessment and Oversight” and Section 5.0, “Data Validation and Usability.” Generally, data that do not meet the established acceptance criteria are cause for re-sampling and re-analysis. However, in some cases, data that do not meet acceptance criteria are usable with

specified limitations. Data that are indicated as usable with limitations will be included in the final report, but will be clearly indicated as having limited usability. Indicators of data limitations include data qualifiers, quantitative evaluations, and narrative statements regarding potential bias.

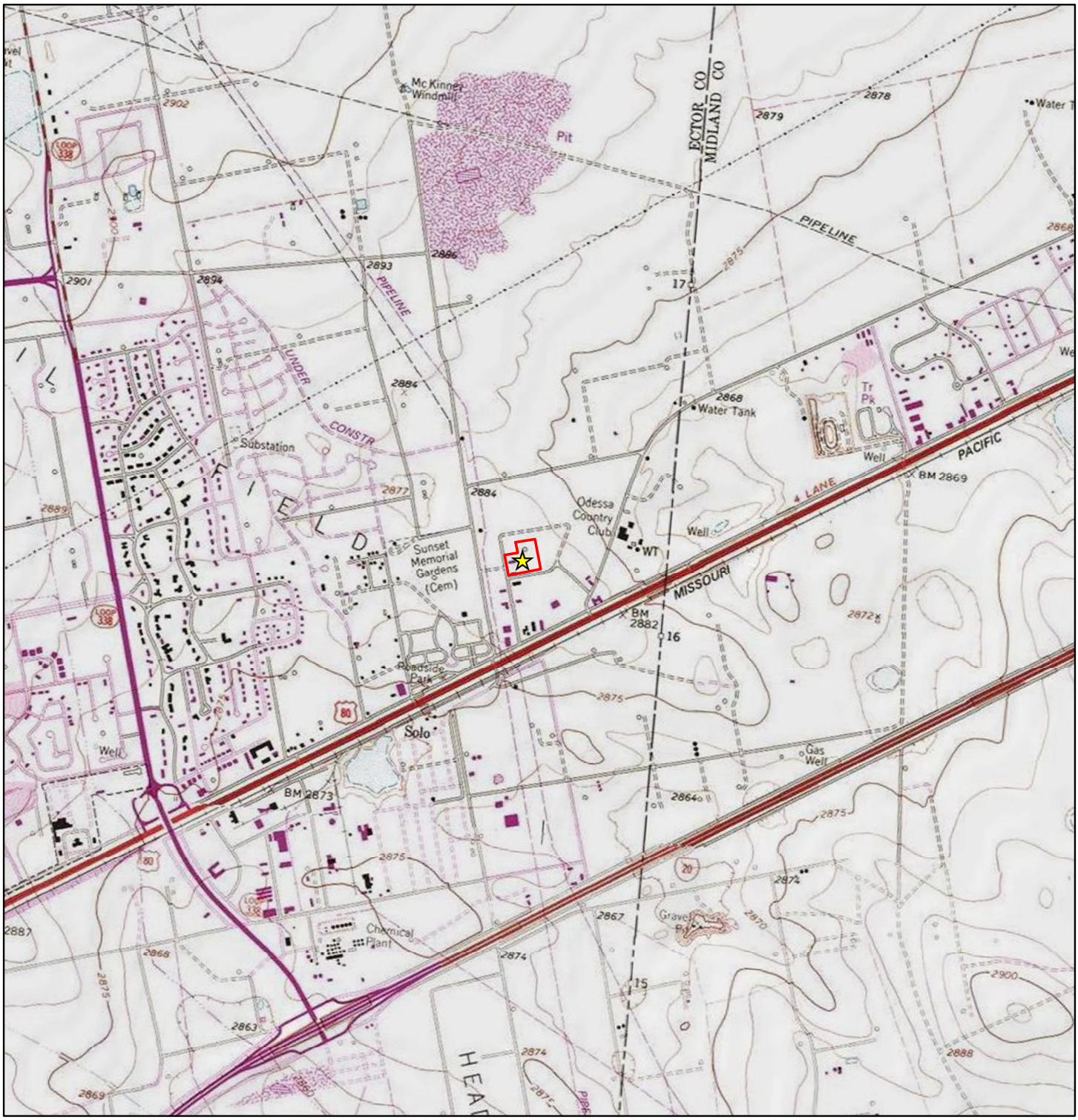
6.0 DELIVERABLES AND PROJECT ORGANIZATION

At the completion of field activities and receipt of validated laboratory analytical data, a sampling activities report will be submitted to the EPA. The sampling activities report will document all pertinent sampling activities and the results of sample analyses.

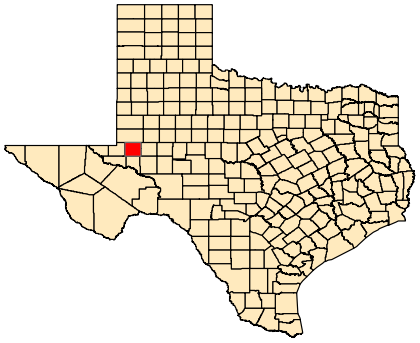
The EPA OSCs, Mike McAteer and Bill Rhotenberry, will provide overall direction for this project and will identify sampling needs, determine the sampling schedule, and coordinate community relations.

The START-3 Project Manager (PjM), Noel Biscocho is the primary contact with the EPA. The START-3 PjM is responsible for project team organization, supervision of all project tasks, monitoring and documenting the quality of all work produced by the project team, determining deviations from the QASP, and assisting with the overall sampling effort. The analytical results of the samples collected will be verified and qualified by a chemist with CSS-Dynamac.

FIGURES



Map of Texas



Legend

★ Ector Drum Site

N
W E
S

1:24,000

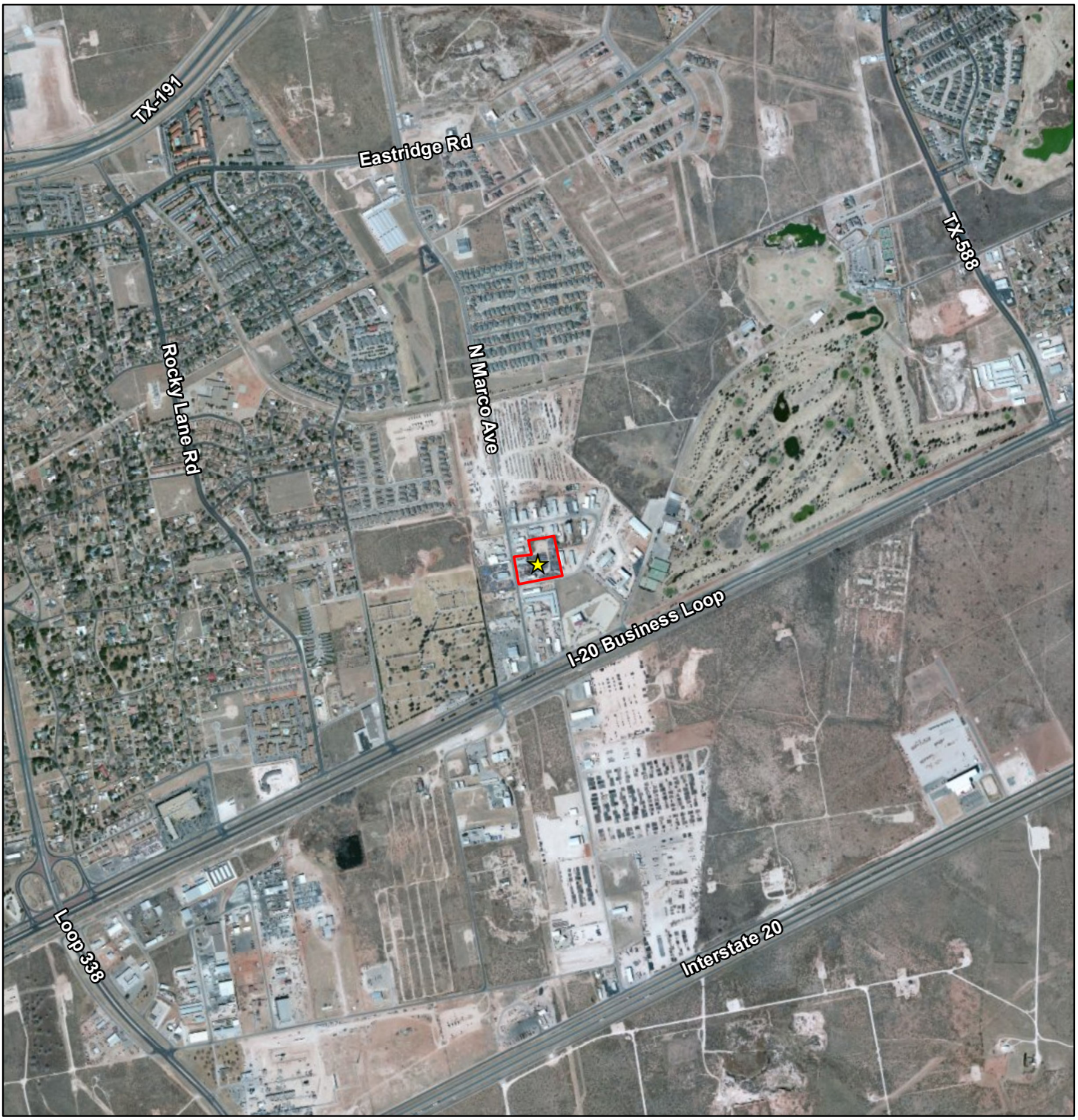
0 1,000 2,000 4,000 Feet

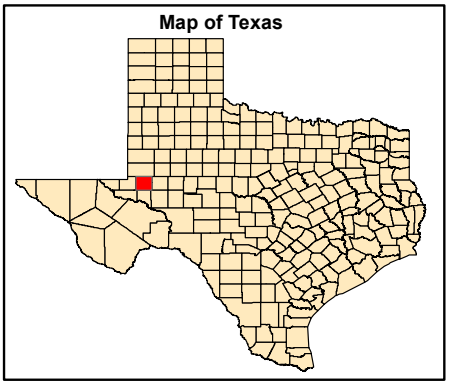
US EPA Region 6
START-3

Figure 1. Site Location Map for Ector Drum Site
2604 N. Marco Avenue,
Odessa, Ector County, TX 79762

TDD No. 1/Dynamac-077-15-001
SSID No. A6KS
CERCLIS No. TBD

Source: 2013 National Geographic Society (Odessa NE Quadrangle)





Legend

Ector Drum Site

N
W E
S

1:18,000

0 750 1,500 3,000 Feet

US EPA Region 6
START-3

Figure 2. Aerial Site Location Map for Ector Drum Site
2604 N. Marco Avenue
Odessa, Ector County, TX 79762

TDD No. 1/Dynamac-077-15-001
SSID No. A6KS
CERCLIS No. TBD

Source of Imagery: Esri, DigitalGlobe, GeoEye, i-cubed, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community. (Downloaded 5/12/2015)

TABLES

TABLE 1
SAMPLE COLLECTION SUMMARY

Sample Matrix	Sample Location	Analyses	Composites or Grab Samples	Trip Blank Samples	MS/MSD	Field Duplicates	Rinsates
On-property Surface Soil	1 to 10 locations	TCL VOAs, SVOAs Pesticides and PCBs, TAL Metals/Hg/CN, TPH, and Flashpoint	Grab	None	1 per 20 samples	1 per 10 samples	NA
On-property Waste (liquid)	1 to 4 locations	TCL VOAs, SVOAs Pesticides and PCBs, TAL Metals/Hg/CN, TPH, and Flashpoint	Grab	None	NA	NA	NA
On-property Waste (solids /sludge)	1 to 4 locations	TCL VOAs, SVOAs Pesticides and PCBs, TAL Metals/Hg/CN, TPH, and Flashpoint	Grab	None	NA	NA	NA

TABLE 2
SAMPLING and ANALYSIS SUMMARY

Matrix	Analytical Parameter	Analytical Method	Containers (Number, Size, and Type)	Preservation Requirements	No. of Samples	No. Field Duplicates	No. MS/MSD Pairs	No. of Equipment Rinsate Samples	No. of Trip Blanks	Total Number of Samples to Lab*
Surface Soil	TCL SVOAs Pesticides, and PCBs, TAL Metals/Hg/CN; TPH	SW846 (8270C, 8081A, 8082, Metals-ICP, 7471A, 9010C/901), TPH: TX-1005	Organics: 1, 8 oz. wide mouth jar; Inorganics: 1, 8 oz. wide mouth jar	Organics: Cool to 4°C Inorganics: Cool to 4°	10	1	1	0	0	11
Surface Soil	TCL VOAs	SW846 (8260B)	(3) 5-gram Encore™ samplers	Cool to 4°C	10	1	1	0	0	11
Waste (liquid)	TCL VOAs TCL SVOAs Pesticides, and PCBs, TAL Metals/Hg/CN; TPH	SW846 (8260B) SW846 (8270C, 8081A, 8082, Metals-ICP, 7471A, 9010C/901), TPH: TX-1005	Organics: 1, 8 oz. wide mouth jar; Inorganics: 1, 8 oz. wide mouth jar	Organics: Cool to 4°C Inorganics: Cool to 4°	4	0	0	0	0	4
Waste (sludge)	TCL VOAs TCL SVOAs Pesticides, and PCBs, TAL Metals/Hg/CN; TPH	SW846 (8260B) SW846 (8270C, 8081A, 8082, Metals-ICP, 7471A, 9010C/901), TPH: TX-1005	Organics: 1, 8 oz. wide mouth jar; Inorganics: 1, 8 oz. wide mouth jar	Organics: Cool to 4°C Inorganics: Cool to 4°	4	0	0	0	0	4

Notes:

*Total number of samples to the laboratory does not include MS/MSD samples. However, please note that MS/MSD or spike/duplicate analysis may require additional sample volume.

(X) Number of optional samples that may be collected; samples may be sediments or soils.

KEY

ºC - Degrees Celsius
CLP – Contract Laboratory Program
HNO_3 – Nitric Acid
MS/MSD – Matrix Spike/Matrix Spike Duplicate
N/A – Not applicable
NaOH – Sodium Hydroxide
SOW – Statement of Work
TCL – Target Compound List
TAL – Target Analyte List

TABLE 3
Proposed Sample Locations

Sample ID	Sample Location	Sample Type
ED-S01	To Be Determined	Soil
ED-S02	To Be Determined	Soil
ED-S03	To Be Determined	Soil
ED-S04	To Be Determined	Soil
ED-S05	To Be Determined	Soil
ED-S06	To Be Determined	Soil
ED-S07	To Be Determined	Soil
ED-S08	To Be Determined	Soil
ED-S09	To Be Determined	Soil
ED-S010	To Be Determined	Soil
ED-WS01	To Be Determined	Waste (sludge)
ED-WS02	To Be Determined	Waste (sludge)
ED-WS03	To Be Determined	Waste (sludge)
ED-WS04	To Be Determined	Waste (sludge)
ED-WL01	To Be Determined	Waste (liquid)
ED-WL02	To Be Determined	Waste (liquid)
ED-WL03	To Be Determined	Waste (liquid)
ED-WL04	To Be Determined	Waste (liquid)

Table 4
DATA QUALITY OBJECTIVES
Ector Drum Site

STEP 1. STATE THE PROBLEM	
Determine if CERCLA hazardous substances are present in the surface soils and containers at the site and document if site conditions present an imminent and substantial endangerment.	
STEP 2. IDENTIFY THE DECISION	
If CERCLA hazardous substances are present in the surface soil and containers at the site, and conditions exist for offsite migration the site is eligible for a CERCLA Removal action. If CERCLA hazardous substances are not present in the surface soil or containers at the site, the site may not be eligible for a CERCLA removal action.	
IDENTIFY THE ALTERNATIVE ACTIONS THAT MAY BE TAKEN BASED ON THE DECISIONS.	If CERCLA hazardous substances are found in the surface soil or containers at the site, a CERCLA Removal action can occur. If CERCLA hazardous substances are not found in the surface soils or containers on-site, a CERCLA Removal action may not be warranted; thus an OPA Removal may be considered.
STEP 3. IDENTIFY INPUTS TO THE DECISION	
IDENTIFY THE INFORMATIONAL INPUTS NEEDED TO RESOLVE A DECISION.	Surface soil samples and waste samples from the containers located on site.
IDENTIFY THE SOURCES FOR EACH INFORMATIONAL INPUT AND LIST THE INPUTS THAT ARE OBTAINED THROUGH ENVIRONMENTAL MEASUREMENTS.	National Contingency Plan (NCP) All sample results are environmental measurements.
BASIS FOR THE CONTAMINANT SPECIFIC ACTION LEVELS.	NCP, sample CRQLs and CRDLs; TRRP Tier I Commercial/Industrial Protective Cleanup Levels (PCLs)
IDENTIFY POTENTIAL SAMPLING TECHNIQUES AND APPROPRIATE ANALYTICAL METHODS.	On-Site surface soils – Surface soil samples will be collected using dedicated stainless steel trowels or spoons Surface soil samples will be analyzed for TCL VOCs, SVOCs, Pesticides, PCBS, ; TAL Total Metals/Mercury/Cyanides using EPA methods and Total Petroleum Hydrocarbons (TPH)by TX 1005 method utilized by a START-procured Laboratory On-site Containers: Liquids from drums or totes will be collected with either drum thieves or plastic beakers. The liquid waste samples will be analyzed for TCL and TAL components, TPH, and Flashpoint using a START-procured laboratory. On-site Containers: Solids/Sludges will be collected with the use of dedicated trowels and/spoons. The solids/sludges will be analyzed for TCL and TAL constituents, and TPH by a START-procured laboratory.
STEP 4. DEFINE THE BOUNDARIES OF THE STUDY	

Table 4 DATA QUALITY OBJECTIVES Ector Drum Site	
DEFINE THE DOMAIN OR GEOGRAPHICAL AREA WITHIN WHICH ALL DECISIONS MUST APPLY.	All collected surface soil samples and container waste samples will be collected from the Ector Drum site property.
SPECIFY THE CHARACTERISTICS THAT DEFINE THE POPULATION OF INTEREST.	The primary population of interest are those individuals who work directly adjacent to the site and transient populations.
DEFINE THE SCALE OF THE DECISION MAKING.	Bounds of the samples collected.
DETERMINE THE TIMEFRAME TO WHICH THE DATA APPLY.	Results from this and subsequent potential investigations.
DETERMINE WHEN TO COLLECT THE DATA.	Sample collection will be conducted on May 20, 2015.
IDENTIFY PRACTICAL CONSTRAINTS ON DATA COLLECTION.	EPA/START must obtain access agreements from property owner before sampling or rely on the TCEQ warrant to enter the site..
STEP 5. DEVELOP A DECISION RULE	
SPECIFY THE PARAMETER THAT CHARACTERIZES THE POPULATION OF INTEREST.	TCL VOCs, SVOCs, Pesticides, PCBs, TAL total metals/mercury and cyanide, TPH and flashpoint within the containers and surface soils at the site.
SPECIFY THE ACTION LEVEL FOR THE DECISION.	Contaminants present in the samples of surface soil and containers exceed the CRQL and CRDLs or the TRRP Tier 1 Commercial/Industrial Soil PCLs.
DEVELOP A DECISION RULE.	If CERCLA hazardous substances are present at concentrations greater than their CRQLs or CRDLs in the surface soil and container samples collected at the site, a CERCLA Removal action may occur.
STEP 6. SPECIFY THE LIMITS ON DECISION ERRORS	
DETERMINE THE POSSIBLE RANGE OF THE PARAMETER OF INTEREST.	Concentrations may range from less than CRQLs and CRDLs to greater than 10,000 ppm.
DEFINE BOTH TYPES OF DECISION ERRORS AND IDENTIFY THE POTENTIAL CONSEQUENCES OF EACH.	1. Deciding that the concentrations are below the CRQLs/CRDLS when they are actually greater. 2. Deciding that the concentrations are above the CRQLs/CRDLs when they are actually lower.
ESTABLISH THE TRUE STATE OF NATURE FOR EACH DECISION RULE.	1. Concentrations are greater than the CRQLs/CRDLs 2. Concentration are less than CRQLs/CRDLS
DEFINE THE TRUE STATE OF NATURE FOR THE MORE SEVERE DECISION ERROR AS THE BASELINE CONDITION OR THE NULL HYPOTHESIS (H_o), AND DEFINE THE TRUE STATE FOR THE LESS SEVERE DECISION ERROR AS THE ALTERNATIVE HYPOTHESIS (H_a).	The more severe decision error is to decide that the concentrations are below the CRQLs/CRDLs when they are actually above criteria, Ho – Null hypothesis. Alternate hypothesis – H1 – concentrations are above CRQLs/CRDLs when they are actually below criteria.
ASSIGN THE TERMS “FALSE POSITIVE” AND “FALSE NEGATIVE” TO THE PROPER	Ho = false negative H1 = false positive

Table 4 DATA QUALITY OBJECTIVES Ector Drum Site	
DECISION ERRORS.	
ASSIGN THE PROBABILITY VALUES TO POINTS ABOVE AND BELOW THE ACTION LEVEL THAT REFLECT THE ACCEPTABLE PROBABILITY FOR THE OCCURENCES OF DECISION ERRORS.	Probability values not assigned at this time.
STEP 7. OPTIMIZE THE DESIGN	
REVIEW THE DQOs.	
DEVELOP GENERAL SAMPLING AND ANALYSIS DESIGN. The QASP that these DQOs are attached to reflect the sample and analysis design to meet these objectives.	

APPENDICES

Appendix A

TCEQ Investigation Report

Texas Commission on Environmental Quality
Investigation Report

The TCEQ is committed to accessibility. If you need assistance in accessing this document, please contact oce@tceq.texas.gov

Customer: Generic Incident Principal
Customer Number: CN602295370

Regulated Entity Name: ECTOR DRUM
Regulated Entity Number: RN102263472

Investigation # 1186740

Incident Numbers 200089

Investigator: TRENT MARTIN

Site Classification CONDITIONALLY EXEMPT SMALL QUANTITY GENERATOR

Conducted: 07/25/2014 -- 07/25/2014

No Industry Code Assigned

Program(s): INDUSTRIAL AND HAZARDOUS WASTE

Investigation Type: Compliance Investigation

Location: --- 2504 MARCO DR, ODESSA, TX, 79765 ---

Additional ID(s): 52177

Address: 2504 N MARCO AVE, ODESSA, TX , 79762

Local Unit: REGION 07 - MIDLAND

Activity Type(s): IHWCMPL - Complaint investigation

Principal(s):

Role	Name
RESPONDENT	GENERIC INCIDENT PRINCIPAL
RESPONDENT	UNITED FUEL & ENERGY CORPORATION

Contact(s):

Role	Title	Name	Phone
Regulated Entity Contact	ENVIRONMENTAL MANAGER	MR RANDY BEARD	(432) 556-3939

Other Staff Member(s):

Role	Name
Investigator	RALPH JOHNSON
Supervisor	WILLIAM EDMISTON
QA Reviewer	RALPH JOHNSON

Associated Check List

Checklist Name	Unit Name
IHW COMPLAINT	Ector Drum

Investigation Comments:

INTRODUCTION
On July 25, 2014, Environmental Investigators Ralph Johnson and Trent Martin with the Texas Commission on Environmental Quality (TCEQ) Region 7 - Midland office, conducted a complaint investigation at Ector Drum, Inc. for the potential discharge of contaminated storm water coming from the site. In accordance with TCEQ

policy, the investigation was conducted unannounced. The site is located on 2604 N Marco Ave Odessa, Texas.

BACKGROUND
On June 23, 2014, the TCEQ Region 7 Office, received information alleging that the alleged site had potential discharge of contaminated storm water coming from the site. The Region 7 office was requested to conduct an on-site investigation to investigate the complaint. The complaint incident, #200089 was assigned to Investigator Trent Martin for investigation.

GENERAL FACILITY AND PROCESS INFORMATION
The site is located at 2604 N. Marco Ave. in Odessa, Texas and is operated by Ector Drum owner Mr. Randy Beard. The facility is a drum reconditioning business that is no longer in operation. The tract of land is in an industrial area but has residential areas close to the facility.

SUMMARY OF ON SITE INVESTIGATION
On July 25, 2014, Mr. Martin along with Senior Investigator Mr. Ralph Johnson arrived at the alleged source located 2604 N Marco Ave in Odessa, Texas and proceeded to look into the facility. The investigators were joined by Mr. Ricky George, Ector County Environmental Police. Going around the facility, it was noted that there were numerous openings throughout the fence line. Mr. Martin, Mr. Johnson, and Mr. George entered the facility through one of the broken fence panels and walked through the facility.

Upon entering the operating area it was discovered that there were many 350 gallon tote-containers and 55 gallons drums that were noted to be full of unknown chemical. Also, the ground surface at various locations showed evidence of chemical contamination most likely from long-term drum storage. Underneath the loading rack nearby observed a 20'X10'X4"pool of an oily brown liquid.

The facility waste storage tanks (Fac.001 and 002) are 200 bbl. tank and a 160 bbl. tank respectively. The concrete secondary containment vault was full of a mixture of water and unknown chemical. The freeboard was estimated to be approximately six to eight inches.

The investigators continued to walk the entire property and discovered many more 350 gallon tote-containers and 55 gallons drums as well as a good amount of contamination on the ground. Other chemicals that were also used on-site at time of operations were discovered to still be in the facility. At the back ends of the facility, many 55 gallon drums were sealed and were found to be fool of unknown chemicals.

Upon completion of the walk through of the facility, it was noticed that many of the original equipment that was at the facility was no longer there, but now housed many of the totes and drums for the facility.

SUMMARY OF EXIT INTERVIEW CONFERENCE
Due to the excess amounts of waste that was left on-site, an enforcement action will be pursued citing 30 TAC 335.4 for the large amount of waste stored on-site that may contribute to the discharge of industrial waste from the site during rainfall events and endanger public health and the environment. Mr. Beards was notified by phone about the Enforcement Action.

ADDITIONAL INFORMATION
Due to the threat posed by the existing site conditions, Critical Infrastructure Division was contacted about the location. State contractor, SWS Environmental was subsequently notified for their response to assess site conditions. Upon reaching an agreement, SWS will secure the site, conduct random sampling of the drums and totes, overpack leaking containers, and remove wastes accumulated in the secondary containment structure.

CONCLUSION
The investigation on July 25, 2014, determined that the site was in violation of 30 TAC 335.4 for the large amount of waste that was discovered at the site that could cause the discharge of industrial waste in the area and endanger public health and welfare. Based on the findings of this investigation, a Notice of Enforcement will be sent to Mr. Randy Beard.

NOE Date: 8/20/2014

OUTSTANDING ALLEGED VIOLATION(S)

ASSOCIATED TO A NOTICE OF ENFORCEMENT

Track Number: 545847 **Compliance Due Date: 02/16/2014**

Violation Start Date: Unknown

30 TAC Chapter 335.4

Alleged Violation:

Investigation: 1186740 Comment Date: 08/18/2014

Failure of the company to dispose of the excessive amount of industrial waste that was collected and stored on-site, that could be discharged into the surrounding areas, cause a nuisance for the surrounding area, and cause the endangerment to the public health and welfare.

Recommended Corrective Action: Remove all waste that was left on site. Begin the remediation process of removing all contaminated land and correcting the damages.

Signed **Date** _____

_____

Environmental Investigator

Signed **Date** _____

_____

Supervisor

Attachments: (in order of final report submittal)

_X__Enforcement Action Request (EAR)

_X__Letter to Facility (specify type) : NOE

Investigation Report

____Sample Analysis Results

____Manifests

____Notice of Registration

_X__Maps, Plans, Sketches

_X__Photographs

____Correspondence from the facility

____Other (specify) :

_____

_____

Appendix B

Drinking Water Survey Report and Water Well Inventory

DRINKING WATER SURVEY REPORT
AND
WATER WELL INVENTORY

Lonestar Drum Facility

2604 North Marco Avenue
Odessa (Ector County), Texas 79762

October 28, 2014

Prepared for:

Texas Commission on Environmental Quality
Petroleum Storage Tank Division
State Lead Remediation Section
P.O. Box 13087, MC-136
Austin, Texas 78711-3087

Prepared by:
SWS Environment
9204 Hwy 287 NW
Fort Worth, Texas 76131

SWS Project No. RW2-410-1411

SWS ENVIRONMENTAL SERVICES

SWS ENVIRONMENTAL SERVICES

Emergency Response
Remediation
Field Services
Waste Services

9204 Hwy 287 NW
Fort Worth, TX 76131
Phone: 817.847.1333
Fax: 817.306.8086
www.swsenvironmental.com

October 28, 2014

MC-137
Omar Valdez
EMERGENCY RESPONSE COORDINATOR
TEXAS COMMISSION ON ENVIRONMENTAL QUALITY
P.O. BOX 13087
AUSTIN, TEXAS 78711-3087

RE: Drinking Water Survey, Former Lonestar Drum Facility, 2604 North Marco Avenue, (Ector County) Texas, SWS Job # RW2-410-1411

Dear Mr. Valdez:

On October 8, 2014, SWS received a request from the Texas Commission on Environmental Quality ("TCEQ") to conduct a Drinking Water Survey in accordance with Texas Water Code Section 26.408 covering a 0.5-mile radius around the Former Lonestar Drum Facility located at 2604 North Marco Avenue in Odessa, Ector County, Texas (See Attachment 1-Figures 1 and 2). This work was conducted under SWS's TCEQ Regional Umbrella Emergency Response contract and was authorized under a Work Order issued by the TCEQ Emergency Response Program coordinator (Mr. Anthony Buck). The work order was authorized following the discovery by SWS on October 8, 2014 during sampling of the onsite well of approximately 1.8 ft. of Phase Separated Hydrocarbons (PSH) in the wellbore. Based on observations made during the field activities,, the oil apparently ran into the well casing through an electric conduit as a result of surface water runoff impacted by releases of oil from drums at the site.-SWS personnel used bags of concrete to build a berm around the well to prevent additional impacts from future rainfall events. Following the discovery of the PSH, SWS contacted and notified TCEQ representatives of the impact to this well. The TCEQ Central Office TCEQ coordinator immediately authorized SWS to conduct a water well survey and SWS ordered a 0.5-mile radius water well records search from Banks Environmental Data ("Banks") out of Austin, Texas. The Banks report is included as Attachment 3 of this report. Banks' report was received on October 13, 2014 and SWS personnel mobilized to the site on October 13, 2014 to conduct the 500-foot visual survey and a 0.25-mile radius door to door walking water well survey. The results of these surveys are shown in Attachments 1, 2 and 3 of this report. **The results of the Banks survey indicated that 73 water wells (domestic, irrigation, industrial and public water supply) were identified by Banks Environmental Data in use within 0.5 miles of the site. (See Figure 2.0 and Banks Report – Attachment 3.0). The door to door survey conducted by SWS revealed a total of 50 wells within a 0.25 radius of the site (See Table 1 and Figure 2).**

Groundwater Contamination

On October 8, 2014 SWS mobilized to the site to collect a water sample from the onsite water well. Prior to sampling the well, an interface probe was used to gauge the well for the presence

9204 Hwy 287 NW
Fort Worth, TX 76131
Phone: 817.847.1333
Fax: 817.306.8086
www.swsenvironmental.com

of Phase Separated Hydrocarbons (PSH). Approximately 1.8 feet of oil was measured in the well bore at a depth of 27.45 feet below ground surface. SWS personnel collected a sample of the non-aqueous and aqueous phase liquids and submitted the samples to Xenco Laboratories of Dallas, Texas. The samples were analyzed for concentrations of total metals (EPA Method 6010), volatile and semi-volatile organic compounds (EPA Method 8260 and 8270) and TPH (TX Methods 1005 and 1006).

An evaluation of the laboratory analytical results for the oil phase indicated concentrations of arsenic (2.46 mg/L),chromium (33.1 mg/L), copper (5.00 mg/L), lead (3.34mg/L), nickel (2.92 mg/L), and zinc (274 mg/L) all exceeded the TRRP Tier I Residential Groundwater Protective Concentration Levels (PCLs). For the water phase, concentrations of mercury (0.00211 mg/L), chromium (0.298 mg/L), and zinc (7.41 mg/L) exceeded the TRRP Tier I Residential Groundwater Protective Concentration Levels (PCLs) of 0.002 mg/L), 0.10 mg/L and 7.3 mg/L respectively. It should be noted however, that because of the nature of the matrix, the detection limits for all of the other *non-detected* priority pollutant metals (except for silver) are **above** the TRRP Tier I Residential Groundwater Protective Concentration Levels (PCLs). Similarly, no VOCs or SVOCs were detected but the detection limits were so elevated due to the dilution the samples were required to be ran at (1000 x). A benzene concentration (2.90 mg/L) was reported at a concentration below the quantitation limit (J Flagged) but above the laboratory detection limit at 1.00 mg/L. This concentration, although estimated, is substantially above the TRRP Tier I Residential Groundwater PCL of 0.005 mg/L established for this compound. The Texas 1005 TPH results indicated elevated total petroleum hydrocarbons (TPH) for the oil phase at 533,000 mg/kg and for the water phase (274 mg/L). The speciation of the TPH by TX Method 1006 indicated aliphatic hydrocarbons in the C6-C8 carbon range below the laboratory detection limits, C8-C10 (0.300 mg/L), C10-C12 (210 mg/L). C12-16 (4.61 mg/L), C16-C21 (15.3 mg/L) and C21-C35 (264 mg/L) exceeding the TRRP Tier I Residential Groundwater PCLs for the C12-C16 fraction established at 2.4 mg/L and for the C21-C-C35 fraction established at 39 mg/L. For the aromatic hydrocarbons, the laboratory reported C-7-C12 below the laboratory detection limits, C12-C16 (0.390 mg/L), C16-C21 (4.73 mg/L) and C21-C36 (17.3 mg/L). A comparison with the TRRP Tier I Residential Groundwater PCLs indicated the C12-C16, C16-C21 and C21-C36 carbon ranges exceed the criteria of 0.98 mg/L, 0.73 mg/L and 0.73 mg/L respectively. A copy of the signed laboratory report and completed chain of custody document is included as attachment 4.0 of this report.

Public Water Supply Availability

Following the site inspection, SWS personnel contacted personnel with the City of Odessa Water Administration Office (Mr. Agapita Bernal, Ph. No 432-335-3210) to verify the public water supply availability for the area. Eighteen of the thirty-five facilities surveyed have City water availability based on conversation with Mr. Bernal although only a few have connected to this service. These include the new housing developments located northwest, north, and northeast of the subject property and the City of Odessa Country Club as well as a few of the businesses located on North Marco and on US Business 20. The New Life Church located at 7184 Club Drive is currently in the process of converting over to City water and will use their wells for

9204 Hwy 287 NW
Fort Worth, TX 76131
Phone: 817.847.1333
Fax: 817.306.8086
www.swsenvironmental.com

irrigation purposes only. The City of Odessa obtains water from surface water reservoirs including, O.H. Ivie, Lake Spence, and Thomas and some water wells provide water for use by residents within the City limits.

During the field inspection, conducted as part of this survey, attempts were made to locate city water meters at all surveyed locations as a further indication of the use of the public water supply within a 0.25 radius of the subject site. City water meters were observed at only a few locations. The survey area is made up primarily of residential and mixed commercial properties. A residential area is located northwest north and northeast of the subject site and all the residences are provided with water from the City of Odessa.

The survey area has recently been added as part of the Groundwater Conservation District with Mr. Tom Kerr as the director (Ph. 432-335-4634).

0.5-Mile Water Well Records Search

The Banks 0.5-mile Water Well Report™ (Attachment 3) indicated 73 water wells (domestic, irrigation, industrial and public water supply) were identified in use within 0.5 miles of the site. The Banks report identified four (4) public water supply wells operated by New Life Church located at 7184 Club Drive. The field survey however indicated that only two wells are located at this site. The facility was once part of the City of Odessa Country Club and the water wells supply the onsite pool. Bottled water for drinking water is provided although the ice maker is currently connected to the water wells onsite. According to Mr. Tim Halstead (Pastor) the Church is in the process of converting entirely to City water and a newly installed City water meter was observed at the site during the field survey. The water wells owned by Permian Homes are being used only for irrigation purposes according to Mr. Scott Cook (Permian Homes Superintendent). All the new homes are provided City water and water meters were observed at all the residences inspected during the field survey. Communication with the manager of the Odessa Country Club indicated that all the wells depicted in Banks Report (7 wells) are utilized solely for irrigation purposes and the Club House is provided water by the City of Odessa Public water supply. Similarly, based on communication with the funeral director (Mr. Mel Wideman) the wells identified by Banks at Sunset Memorial Gardens located at 6801 East Business 20, are used for irrigation purposes and City water is provided for domestic use.

500-Foot Visual Survey and 0.25-Mile Walking Water Well Survey

A visual walking door-to-door water well survey was performed within at least 500 ft. of the release site in all directions. A walking and driving survey was conducted within at least 0.25 miles of the release site and the door to door survey results are summarized in Table 1.0. The results of the field survey and water well inventory revealed the presence of fifty (50) water wells within 0.25 mile radius of the subject site. Based on interviews with the well owners/users most of the wells are not used for drinking water purposes but are mainly used to provide water for washing hands at sinks and for water for toilets and irrigation purposes. Three facilities however had ice machines connected to the water supplied from their onsite wells including

SWS ENVIRONMENTAL SERVICES

Emergency Response
Remediation
Field Services
Waste Services

9204 Hwy 287 NW
Fort Worth, TX 76131
Phone: 817.847.1333
Fax: 817.306.8086
www.swsenvironmental.com

Schoppa's Material Handling located at 2627 North Marco Ave., Permian Anchors located at 6927 East Business 20, and New Life Church located at 7184 Club Drive. The usage of water from wells at six (6) facilities was not documented as no one was available to interview. These facilities include: 1) H.K. Electric located at 2701 North Marco Avenue, 2) Mr. Bobby Moore-6938 East Commerce Street, 3) B- Mac Corporation, 6955 East Commerce Street, 4) Adam Doyle-6958 East Commerce Street, 5) PRB Machine -6968 East Commerce Street and 6) APP Auto Pax/Cardinal Industries Inc. located at 6977 East Commerce Street.

We appreciate the opportunity to assist you with this project and to provide you with this information. If you have any questions, please call me at 817 829-9135.

Sincerely,

Damon Waresback, P.G.
Senior Geologist

Attachments: Figure 1.0 Site Vicinity Map, Figure 2.0 Aerial Photograph, Table 1.0 Survey Data, Banks 0.5-Mile Radius Water Well Report, Access Agreements, Analytical Data

Emergency Response
Remediation
Field Services
Waste Services

9204 Hwy 287 NW
Fort Worth, TX 76131
Phone: 817.847.1333
Fax: 817.306.8086
www.swsenvironmental.com

ATTACHMENT 1

Vicinity Map - Figure 1

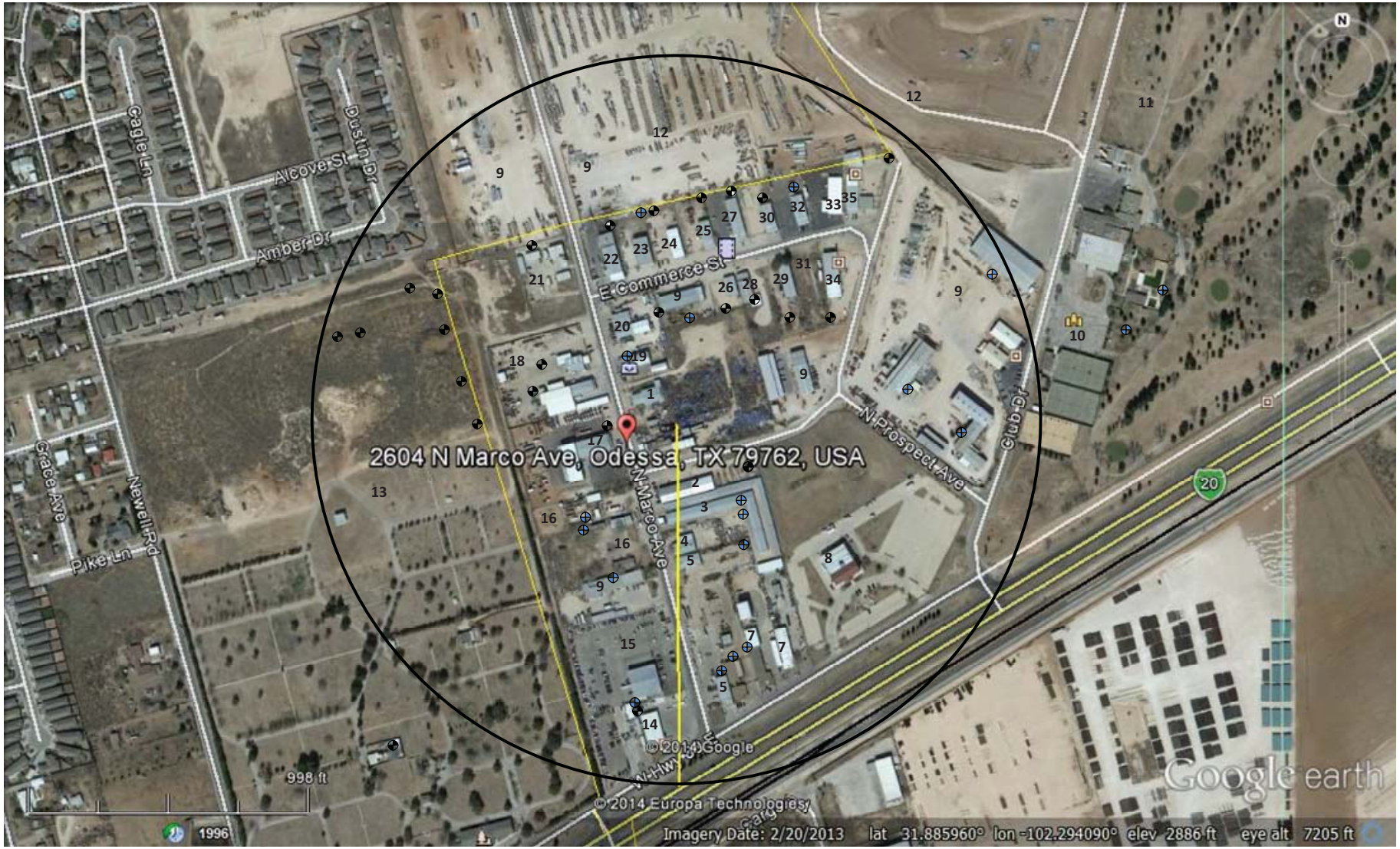
Water Well Location Map - Figure 2

SWS ENVIRONMENTAL SERVICES
9204 Hwy 287 NW
Fort Worth, Texas 76131

Date: 10/28/2014

Figure 1.0
Site Vicinity Map
Lonestar Drum Facility
2604 North Marco Avenue
Odessa (Ector County), TX 79762

N



SWS ENVIRONMENTAL SERVICES 9204 NW Hwy 287 Fort Worth, TX 76131	Date: 10/14/14 Project No. RW2-410-1411	Figure 3.0 0.25-Mile Radius Aerial Map 2604 N. Marco Ave. Odessa, Texas 79762

Emergency Response
Remediation
Field Services
Waste Services

9204 Hwy 287 NW
Fort Worth, TX 76131
Phone: 817.847.1333
Fax: 817.306.8086
www.swsenvironmental.com

ATTACHMENT 2

Table 1 – Survey Data

Table 1
Properties Surveyed Within 0.25 Mile of
2604 N. Marco Ave.
Odessa, Texas 79762

SWS Figure 1.0 Map ID No.	Banks Env. Well No.	State Well ID No.	Distance from known extent of groundwater impact contamination (feet)	Physical Address of Well Latitude Longitude (Decimal Degrees)	Well No.	Total Depth (feet)	Screened Interval (feet)	Sealed Interval (feet)	Private Drinking Water Well? (Yes or No)	Affected or Potentially Affected? (Yes or No)	Property Name, Current Mailing Address	Well Users Name, Current Mailing Address
1	Not Identified	NA	Subject Site	31.88548 Lat. -102.29437 Long.	1 well	UNK	UNK	UNK	Well formerly used as PW, well at store not in use	Yes -1.5 ft. PSH	Former Lonestar Drum Recycling	Ronny Beard
2	Not Identified	NA	293' and 764'	31.88548 Lat. -102.29349 Long./ 31.887923 Lat. -102.295131 Long	2 Wells-1 at each location	UNK	UNK	UNK	Wells used for toilets/washing hands	Not at present time*	Guardian Wellhead Protection, 2584 North Marco and 6907 E. Commerce, Odessa 79762	C/O Lance Bolds- Attorney 11757 Katy Freeway, Houston Texas 77079
3	3 & 4	45-06-8NN WIID3137	350' and 334'	31.885157 Lat. -102.293884 Long./ 31.884999 Lat. -102.29361 Long.	2 Wells Adjacent	110' 120'	80-110' 60-120'	0-20' 0-60'	Stephenson well used for toilets	UNK	Former Foster Storage	*Randy Stephenson 2564 North Marco Ave., Odessa, TX 79762
4	Not Identified	NA	NA	NA	NA	NA	NA	NA	City Water	NA	Woody Gregory	2414 North Marco Ave., Odessa, TX 79762
5	Not Identified	45-0-08 2 others not idenitified	443', 875'm 834'	31.884842 Lat. -102.293566 Long./ 31.883519 Lat. -102.293838 Long./ 31.883667 Lat. -102.293662 Long.	3 Wells have City Water	112' UNK UNK	71-112 UNK UNK	UNK UNK UNK	No, used for irrigation	UNK	Scott Thane Ditching Service LTD 6901 E. Business 20 Odessa, TX 79768	*Scott Thane P.O. Box 13888, Odessa, TX 79762
6	Not Identified	NA	813'	31.883796 N Lat -102.293515 W Long.	1 well	UNK	UNK	UNK	Yes, use well for ice maker	UNK	Permian Anchors 6927 E. Business 20 Odessa, TX 79762	*Sylvia Herriage 6927 E. Business 20 Odessa, TX 79762
7	Not Identified	NA	797'	31.883923 Lat. -102.293182 Long.	1 well	UNK	UNK	UNK	Well used for toilets ect.	UNK	Satellite Distributors 6931 E. Business 20 Odessa, TX 79762	Satellite Distributors 6931 E. Business 20 Odessa, TX 79762
8	Banks 7 & 13 Misplotted	NA	628'	31.884645 Lat. -102.293072 Long.	1 well for irrigation	UNK	UNK	UNK	City Water	UNK	Graham Brothers Entertainment 6999 E. Business 20 Odessa, TX 79762	Graham Brothers Entertainment 6999 E. Business 20 Odessa, TX 79762
9	8 Misplotted	NA	1035', 1268', 831'	31.885861 Lat. -102.291020 Long./ 31.887549 Lat. -102.290801 Long./ 31.886282 Lat. -102.291723 Long.	3 wells	UNK UNK UNK	UNK UNK UNK	UNK UNK UNK	Bottled drinking water/toilets, ect.	UNK	Rama Fabricators P.O. Box 7346 Odessa, Texas 79760-7346	*Ronny Rains/Rama Fabricators P.O. Box 7346 Odessa, Texas 79760-7346
9	Not Identified	NA	597'	31.88432 N Lat. -102.294994 Long.	1 well	UNK	UNK	UNK	Bottled water/irrigation, toilets	UNK	Rama Fabricators P.O. Box 7346 Odessa, Texas 79760-7346	*Ronny Rains/Rama Fabricators P.O. Box 7346 Odessa, Texas 79760-7346

Table 1
Properties Surveyed Within 0.25 Mile of
2604 N. Marco Ave.
Odessa, Texas 79762

SWS Figure 1.0 Map ID No.	Banks Env. Well No.	State Well ID No.	Distance from known extent of groundwater impact contamination (feet)	Physical Address of Well Latitude Longitude (Decimal Degrees)	Well No.	Total Depth (feet)	Screened Interval (feet)	Sealed Interval (feet)	Private Drinking Water Well? (Yes or No)	Affected or Potentially Affected? (Yes or No)	Property Name, Current Mailing Address	Well Users Name, Current Mailing Address
9	Not Identified	NA	361'	31.886961 Lat. -102.294991 Long.	1 well	UNK	UNK	UNK	Bottled water/irrigation, toilets	UNK	Rama Fabricators P.O. Box 7346 Odessa, Texas 79760-7346	*Ronny Rains/Rama Fabricators P.O. Box 7346 Odessa, Texas 79760-7346
10	27, 31, 34, 39, 42	See Banks Report	1641', 1774'	31.886872 Lat. -102.289180 Long./ 31.887266 Lat. -102.288849 Long	2 wells identified	See Banks Report	See Banks Report	See Banks Report	Yes, ice maker, pool	UNK	New Life Church 7184 Club Drive Odessa, TX 79762	*Tim Halstead, Pastor 7184 Club Drive Odessa, TX 79762
11	7, 15, 17, 22, 23, 28, 31	See Banks Report	Various	See Banks Report	7+	See Banks Report	See Banks Report	See Banks Report	No-Club house on City Water	UNK	Odessa Country Club No. 1 Fairway Drive Odessa, TX 79765	Ryan George, Club Manager No. 1 Fairway Drive Odessa, TX 79765
12	18, 19, 24, 25, 26, 46, 56	See Banks Report	Various	See Banks Report	8+	See Banks Report	See Banks Report	See Banks Report	City Water wells for irrigation	UNK	Permian Homes LLC 13020 Hwy 191 Odessa, TX 79707	David Cook, President 13020 Hwy 191 Odessa, TX 79707
13	9, 12, 13, 16, 21, 29, 40	See Banks Report	Various	See Banks Report	7+	See Banks Report	See Banks Report	See Banks Report	City Water wells for irrigation	UNK	Sunset Memorial Gardens 6801 E. Business 20 Odessa, TX 79762	Mel Wideman, Funeral Director 6801 E. Business 20 Odessa, TX 79762
14	14	45-06-8NN	1058'	31.883124 Lat. -102.294799 Long.	1 well	113'	50-113'	48-50'	Water used for toilets, sinks	UNK	Ewing Golf & Irrigation 6895 E. Business Hwy 20 Odessa, TX 79762	Tyler Mayes, Manager 6895 E. Business Hwy 20 Odessa, TX 79762
15	Not Identified	NA	1028'	31.883213 Lat. -102.294822 Long.	1 well	UNK	UNK	UNK	Water used for toilets, sinks	UNK	Midland-Odessa Auto Auction 2521 N. Marco Ave. Odessa, TX 79762	Kye Johnson, Owner 2521 N. Marco Ave. Odessa, TX 79762
16	1 idenitified, 6	45-06-8	558' 524'	31.884912 Lat. -102.295492 Long./ 31.884727 Lat. -102.295362 Long.	2 wells	107' UNK	50-107' UNK	0-15' UNK	Water used for irrigation, toilets, sinks	UNK	*Tommy and Brianne Hudson 2565 N. Marco Ave. Odessa, TX 79762	*Tommy and Brianne Hudson 2565 N. Marco Ave. Odessa, TX 79762
17	2	45-06-8NN	336'	31.886031 Lat. -102.295236 Long.	1 well	110'	Not on log	0-30'	well used for toilets, sinks	UNK	Energy Coil & Riggin 2925 N. Marco Ave. Midland, Texas 79762	Energy Coil & Riggin 2925 N. Marco Ave. Midland, Texas 79762
18	Not Identified	NA	451' 485'	31.886259 Lat. -102.295967 Long./ 31.886888 Lat. -102.295957 Long.	2 wells	UNK UNK	UNK UNK	UNK UNK	Well used for RO ice maker	UNK	Shoppas Material Handling 2627 N. Marco Ave. Odessa, TX 79762	Leroy Bird, Manager 2627 N. Marco Ave. Odessa, TX 79762
19	Not Identified	NA	318'	31.886678 Lat. -102.294949 Long.	1 well	UNK	UNK	UNK	Water used in toilets, sinks	UNK	Vital Signs 2628 N. Marco Ave. Odessa, TX 79762	*Chris Byrne, Owner 2628 N. Marco Ave. Odessa, TX 79762

Table 1
Properties Surveyed Within 0.25 Mile of
2604 N. Marco Ave.
Odessa, Texas 79762

SWS Figure 1.0 Map ID No.	Banks Env. Well No.	State Well ID No.	Distance from known extent of groundwater impact contamination (feet)	Physical Address of Well Latitude Longitude (Decimal Degrees)	Well No.	Total Depth (feet)	Screened Interval (feet)	Sealed Interval (feet)	Private Drinking Water Well? (Yes or No)	Affected or Potentially Affected? (Yes or No)	Property Name, Current Mailing Address	Well Users Name, Current Mailing Address
20	5	45-14-1	418'	31.887095 Lat. -102.29460 Long.	1 well	92'	70-80'	0-59'	Water used in toilets, sinks	UNK	Sabre Energy Services 264 N. Marco Ave. Odessa, TX 79762	David Collyer, Manager 264 N. Marco Ave. Odessa, TX 79762
21	Not Identified	NA	784'	31.887685 Lat. -102.295881 Long.	1 well	UNK	UNK	UNK	UNK, no one available	UNK	H K Electric 2701 N. Marco Ave. Odessa, TX 79762	H K Electric 2701 N. Marco Ave. Odessa, TX 79762
22	Not Identified	NA	293' and 764'	31.88548 Lat. -102.29349 Long./ 31.887923 Lat. -102.295131 Long	2 Wells-1 at each location	UNK	UNK	UNK	Well used for toilets/washing hands	Not at present time*	Guardian Wellhead Protection, 2584 North Marco and 6907 E. Commerce, Odessa 79762	C/O Lance Bolds- Attorney 11757 Katy Freeway, Houston Texas 77079
23	10 10	WIID 13903 2	759'	31.888055 Lat. -102.294721 Long.	1 well	117'	67-117'	50-67' 0-10'	Well used for toilets, sinks	UNK	Davis Lynch/Forum Energy Technologies 6919 East Commerce Odessa, TX 79762	*Kashie Kazanii 6919 East Commerce Odessa, TX 79762
24	Not Identified	NA	768'	31.888052 Lat. -102.294712 Long.	1 well	UNK	UNK	UNK	Well used for toilets, sinks	UNK	Iron Horse Tods LLC 6923 East Commerce Odessa, TX 79762	Michelle Ozuna, Manager 6923 East Commerce Odessa, TX 79762
25	Not Identified	NA	812'	31.888185 Lat. -102.294082 Long.	1 well	UNK	UNK	UNK	well used for toilets, sinks	UNK	Secorp Industries 6937 East Commerce Odessa, TX 79762	Chris Barber 6937 East Commerce Odessa, TX 79762
26	Not Identified	NA	456'	31.887104 Lat. -102.293753 Long.	1 well	UNK	UNK	UNK	UNK	UNK	Bobby Moore 6938 East Commerce Odessa, TX 79762	Bobby Moore 6938 East Commerce Odessa, TX 79762
27	Not Identified	NA	937'	31.888234 Lat. -102.292937 Long.	1 well	UNK	UNK	UNK	well used for toilets, sinks	UNK	County Line Adult Superstore 6947 E. Commerce Odessa, TX 79762	Nick Menke, Manager 6947 E. Commerce Odessa, TX 79762
28	Not Identified	NA	527'	31.887176 Lat. -102.293390 Long.	1 well	UNK	UNK	UNK	Well used for toilets, sinks	UNK	CTI 6926 East Commerce Odessa, TX 79762	Jim Cameron, Owner 6926 East Commerce Odessa, TX 79762
29	Not Identified	NA	570'	31.887050 Lat. -102.293037 Long.	1 well	UNK	UNK	UNK	well used for toilets, sinks	UNK	Ricky New 6948 East Commerce Odessa, TX 79762	Ricky New 6948 East Commerce Odessa, TX 79762
30	Not Identified	NA	873'	31.888205 Lat. -102.293358 Long.	1 well	UNK	UNK	UNK	UNK	UNK	B-Mac Corp. 6955 East Commerce Odessa, TX 79762	B-Mac Corp. 6955 East Commerce Odessa, TX 79762

Table 1
Properties Surveyed Within 0.25 Mile of
2604 N. Marco Ave.
Odessa, Texas 79762

SWS Figure 1.0 Map ID No.	Banks Env. Well No.	State Well ID No.	Distance from known extent of groundwater impact contamination (feet)	Physical Address of Well Latitude Longitude (Decimal Degrees)	Well No.	Total Depth (feet)	Screened Interval (feet)	Sealed Interval (feet)	Private Drinking Water Well? (Yes or No)	Affected or Potentially Affected? (Yes or No)	Property Name, Current Mailing Address	Well Users Name, Current Mailing Address
31	8	WIID35975	576'	31.886944 Lat. -102.292777 Long.	1 well	120'	10-120'	0-20'	UNK	UNK	Adam Doyle 6958 East Commerce Odessa, TX 79762	Adam Doyle 6958 East Commerce Odessa, TX 79762
32	Not Identified	NA	926'	31.888235 Lat. -102.293017 Long.	1 well	UNK	UNK	UNK	Well used for toilets, sinks	UNK	Systech 6965 East Commerce Odessa, TX 79762	*Larry Thorton 6965 East Commerce Odessa, TX 79762
33	Not Identified	NA	1132'	31.888617 Lat. -102.292449 Long.	1 well	UNK	UNK	UNK	well used for toilets, sinks	UNK	Pro Inspection Inc. 6975 East Commerce Odessa, TX 79762	David Nance, Owner 6975 East Commerce Odessa, TX 79762
34	Not Identified	NA	655'	31.886938 Lat. -102.292568 Long.	1 well	UNK	UNK	UNK	Unknown use	UNK	PRB Machine 6968 East Commerce Odessa, TX 79762	PRB Machine 6968 East Commerce Odessa, TX 79762
35	Not Identified	NA	1238'	31.888695 Lat. -102.291982 Long.	1 well	UNK	UNK	UNK	Unknown use	UNK	APP Auto Pax/ Cardinal Industries Inc. 6977 East Commerce Odessa, TX 79762	APP Auto Pax/ Cardinal Industries Inc. 6977 East Commerce Odessa, TX 79762

SWS ENVIRONMENTAL SERVICES

Emergency Response
Remediation
Field Services
Waste Services

9204 Hwy 287 NW
Fort Worth, TX 76131
Phone: 817.847.1333
Fax: 817.306.8086
www.swsenvironmental.com

ATTACHMENT 3

Banks 0.5-Mile Radius Water Well Report

Prepared for:

SWS ENVIRONMENTAL SERVICES-FORT WORTH
PO BOX 18619
Panama City Beach, FL 32417

BANKS ENVIRONMENTAL DATA
A DIVISION OF THE BANKS GROUP

Water Well Report

Lone Star Drum Facility

2604 N. Marco Ave

Odessa, TX

PO #: FW3-408-1470

ES-112845

Friday, October 10, 2014

Table of Contents *Lone Star Drum Facility*

BANKS ENVIRONMENTAL DATA A DIVISION OF THE BANKS GROUP

Geographic Summary *Lone Star Drum Facility*

BANKS ENVIRONMENTAL DATA
A DIVISION OF THE BANKS GROUP

Location
TX

Coordinates	
Longitude & Latitude in Degrees Minutes Seconds	-102° 17' 40", 31° 53' 9"
Longitude & Latitude in Decimal Degrees	-102.294372°, 31.88596°
X and Y in UTM	755919.18, 3530988.64 (Zone 13)

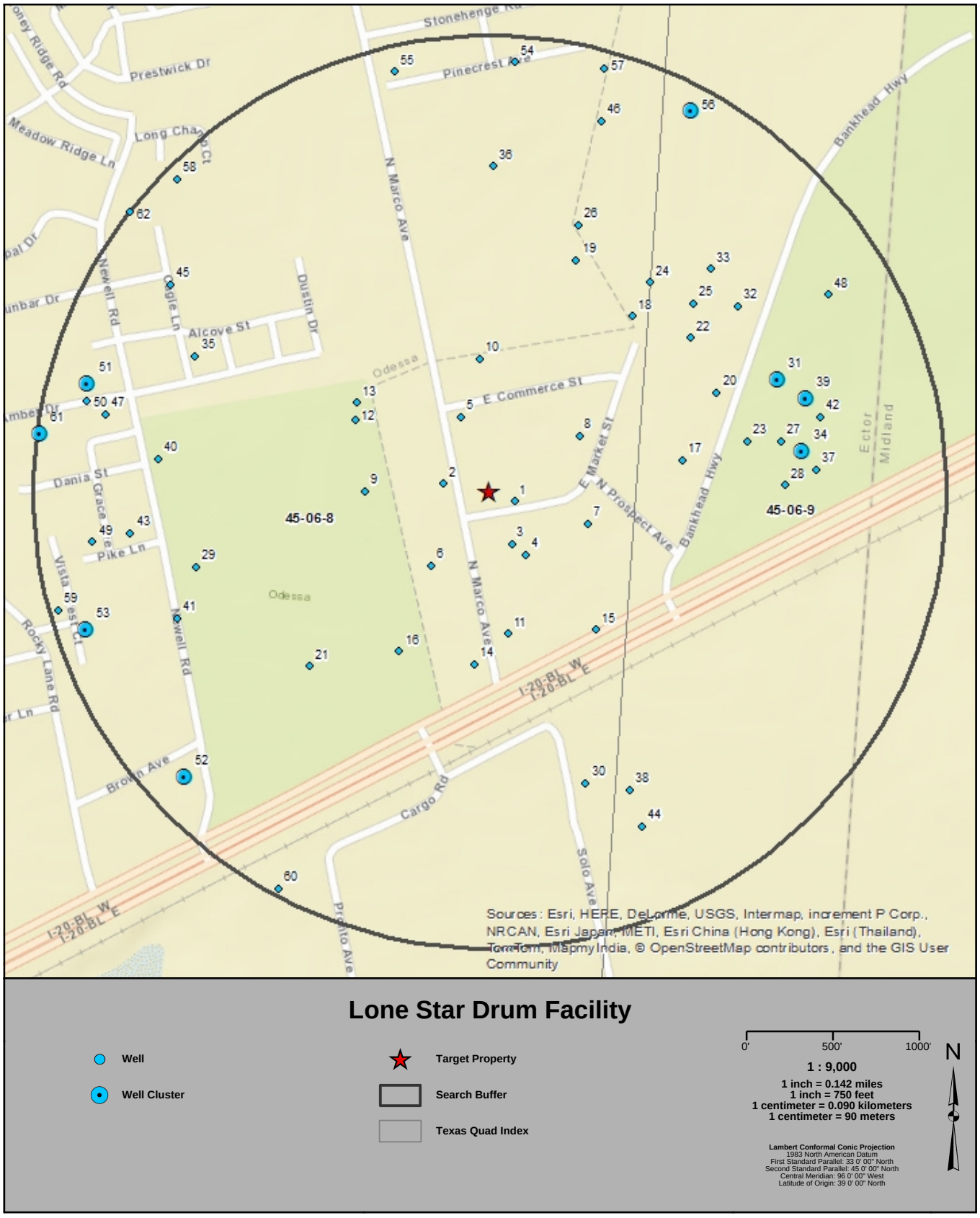
Elevation
Target Property lies 2883.07 feet above sea level.

Zip Codes Searched	
Search Distance	**Zip Codes (historical zip codes included)**
Target Property	79762
0.5 miles	79762, 79765

Topos Searched	
Search Distance	**Topo Name**
Target Property	Odessa NE (1982)
0.5 miles	Odessa NE (1982)

Banks Environmental Data, Inc. - 1601 Rio Grande, Ste. 500 - Austin, TX 78701 - 800.531.5255 P - 512.478.1433 F
www.banksenvdata.com

Summary Map - 0.5 Mile Radius



Lone Star Drum Facility

- Well
- Well Cluster
- Target Property
- Search Buffer
- Texas Quad Index

0' 500' 1000'

N

1 : 9,000

1 inch = 0.142 miles
1 inch = 750 feet
1 centimeter = 0.090 kilometers
1 centimeter = 90 meters

Lambert Conformal Conic Projection
1983 North American Datum
First Standard Parallel: 33 0' 00" North
Second Standard Parallel: 45 0' 00" North
Central Meridian: 96 0' 00" West
Latitude of Origin: 39 0' 00" North

Banks Environmental Data, Inc. - 1601 Rio Grande, Ste. 500 - Austin, TX 78701 - 800.531.5255 P - 512.478.1433 F
www.banksenvdata.com

Topographic Overlay Map - 0.5 Mile Radius

BANKS ENVIRONMENTAL DATA
A DIVISION OF THE BANKS GROUP

Lone Star Drum Facility

Well
Well Cluster
Target Property
Search Buffer

Target Property Quad Name(s)
Odessa NE (1982)

0' 500' 1000'

1 : 9,000
1 inch = 0.142 miles
1 inch = 750 feet

Lambert Conformal Conic Projection
1983 North American Datum
First Standard Parallel: 33 0' 00" North
Second Standard Parallel: 45 0' 00" North
Central Meridian: 96 0' 00" West
Latitude of Origin: 39 0' 00" North

N

Banks Environmental Data, Inc. - 1601 Rio Grande, Ste. 500 - Austin, TX 78701 - 800.531.5255 P - 512.478.1433 F
www.banksenvdata.com

Current Imagery Overlay Map - 0.5 Mile Radius

BANKS ENVIRONMENTAL DATA
A DIVISION OF THE BANKS GROUP

Lone Star Drum Facility

Well
Well Cluster
Target Property
Search Buffer

0' 500' 1000'

1 : 9,000

1 inch = 0.142 miles
1 inch = 750 feet
1 centimeter = 0.090 kilometers
1 centimeter = 90 meters

N

Lambert Conformal Conic Projection
1983 North American Datum
First Standard Parallel: 33 0' 00" North
Second Standard Parallel: 45 0' 00" North
Central Meridian: 96 0' 00" West
Latitude of Origin: 39 0' 00" North

Banks Environmental Data, Inc. - 1601 Rio Grande, Ste. 500 - Austin, TX 78701 - 800.531.5255 P - 512.478.1433 F
www.banksenvdata.com

Water Well Details *Lone Star Drum Facility*

BANKS ENVIRONMENTAL DATA A DIVISION OF THE BANKS GROUP

Map ID	Source ID	Dataset	Owner of Well	Type of Well	Depth Drilled	Completion Date	Longitude	Latitude	Elevation	Driller's Logs
1	WIID294351	TX TWDB WIID	Jamie Poldrack	Domestic	120	6/30/2012	-102.293888	31.885833	2883 ft ()	View
2	45-06-8NN	TX TCEQ HIST	Berry Hill Drilling & Supply	Domestic	110	05/03/1976	-102.295236	31.886031	2883 ft (+)	View
3	45-06-8NN	TX TCEQ HIST	Ch. Foster	Domestic	110	03/12/1982	-102.293884	31.885157	2883 ft ()	View
4	WIID311374	TX TWDB WIID	Randy Stephenson	Domestic	120	1/11/2013	-102.29361	31.884999	2883 ft ()	View
5	45-14-1	TX TCEQ HIST	Petroplex Savings	Industrial	92	10/03/1988	-102.294985	31.887108	2883 ft (+)	View
6	45-06-8	TX TCEQ HIST	Briaane Hudson	Domestic	107	05/03/1995	-102.295352	31.884727	2882 ft (-1)	View
7	45-06-812	TX TWDB GW	Odessa Country Club	Domestic	115	01/01/1946	-102.292499	31.885555	2883 ft ()	View
8	WIID359750	TX TWDB WIID	Adam Doyal	Domestic	120	4/12/2014	-102.292777	31.886944	2882 ft (-1)	View
9	45-06-805	TX TWDB GW	Sunset Memorial Gardens #2 well	Irrigation	116	01/01/1961	-102.296666	31.885833	2883 ft ()	View
10	WIID139032	TX TWDB WIID	Bob Simpkins	Domestic	117	4/8/2008	-102.294721	31.888055	2883 ft ()	View
11	45-06-8	TX TCEQ HIST	Watson Packers	Domestic	112	07/09/1987	-102.293829	31.883726	2882 ft (-1)	View
12	45-06-802	TX TWDB GW	Sunset Memorial Gardens	Irrigation	116	01/01/1963	-102.296944	31.886944	2883 ft (+)	View
13	45-06-809	TX TWDB GW	Sunset Memorial Gardens, Inc. Well #14	Irrigation	120	n/a	-102.296944	31.887221	2883 ft ()	View
14	45-06-8NN	TX TCEQ HIST	American Fence	Domestic	113	n/a	-102.294437	31.883206	2882 ft (-1)	View
15	45-06-813	TX TWDB GW	Odessa Country Club	Irrigation	115	01/01/1946	-102.292221	31.883888	2882 ft (-1)	View
16	45-06-808	TX TWDB GW	Sunset Memorial Gardens	Unused	102	n/a	-102.295833	31.883333	2881 ft (-2)	View
17	45-06-911	TX TWDB GW	Odessa Country Club	Irrigation	115	01/01/1938	-102.290833	31.886666	2880 ft (-3)	View
18	WIID347507	TX TWDB WIID	Permian Home	Domestic	120	10/18/2013	-102.291944	31.888888	2877 ft (-7)	View
19	WIID347506	TX TWDB WIID	Permian Home	Domestic	115	10/18/2013	-102.293055	31.889721	2877 ft (-6)	View
20	WIID238794	TX TWDB WIID	Interstate Treating	Domestic	114	2/1/2007	-102.290277	31.887777	2876 ft (-7)	View
21	45-06-9	TX TCEQ HIST	Sunset Memorial Gardens	Industrial	99	03/31/1988	-102.297485	31.882999	2880 ft (-3)	View
22	45-06-910	TX TWDB GW	Odessa Country Club	Domestic	115	01/01/1938	-102.290833	31.88861	2876 ft (-7)	View
23	45-14-2	TX TCEQ HIST	Odessa Country Club	Irrigation	114	05/27/1997	-102.289662	31.887042	2876 ft (-7)	View
24	WIID347505	TX TWDB WIID	Permian Home	Domestic	115	10/17/2013	-102.291666	31.889444	2875 ft (-8)	View
25	WIID347504	TX TWDB WIID	Permian Home	Domestic	115	10/17/2013	-102.290833	31.889166	2875 ft (-8)	View
26	WIID347788	TX TWDB WIID	Permian Homes	Domestic	115	10/18/2013	-102.293055	31.890277	2876 ft (-7)	View
27	G0680072A	TX TCEQ PWS	NEW LIFE CHURCH	Public Supply	130	n/a	-102.289032	31.887068	2874 ft (-9)	View
28	45-06-905	TX TWDB GW	Odessa Country Club	Irrigation	135	n/a	-102.288888	31.886388	2876 ft (-7)	View
29	45-06-804	TX TWDB GW	Sunset Memorial Gardens	Irrigation	116	01/01/1955	-102.299721	31.884444	2882 ft (-1)	View
30	45-06-9	TX TCEQ HIST	Michael McCulloch	Industrial	113	01/07/2002	-102.292206	31.881444	2878 ft (-5)	View
31	45-06-904	TX TWDB GW	Odessa Country Club	Irrigation	135	n/a	-102.289166	31.888055	2872 ft (-11)	View
31	G0680072D	TX TCEQ PWS	NEW LIFE CHURCH	Public Supply	114	05/27/1997	-102.289032	31.887902	2872 ft (-11)	View
32	WIID355654	TX TWDB WIID	Extreme Exteriors	Irrigation	115	1/28/2014	-102.289999	31.889166	2873 ft (-10)	View
33	WIID304978	TX TWDB WIID	Louis B. Sweeden	Domestic	130	10/12/2012	-102.290555	31.889721	2874 ft (-9)	View
34	45-06-912	TX TWDB GW	New Life Church Well #1	Unused	130	n/a	-102.28861	31.886944	2873 ft (-10)	View
34	G0680072B	TX TCEQ PWS	NEW LIFE CHURCH	Public Supply	130	n/a	-102.28875	31.886792	2874 ft (-9)	View
35	WIID301179	TX TWDB WIID	Gene Kirby	Domestic	120	8/20/2012	-102.3	31.887777	2881 ft (-2)	View
36	WIID115965	TX TWDB WIID	Angle Development	Domestic	110	5/25/2007	-102.294721	31.89111	2878 ft (-5)	View
37	45-06-913	TX TWDB GW	New Life Church Well #2	Unused	130	n/a	-102.288333	31.886666	2874 ft (-10)	View
38	WIID141952	TX TWDB WIID	Pradon Construction	Domestic	110	4/16/2008	-102.291388	31.881388	2877 ft (-6)	View
39	45-06-915	TX TWDB GW	New Life Church Well #4	Unused	114	05/27/1997	-102.28861	31.887777	2871 ft (-12)	View
39	G0680072C	TX TCEQ PWS	NEW LIFE CHURCH	Public Supply	112	08/21/1989	-102.28875	31.887625	2872 ft (-11)	View
40	45-06-803	TX TWDB GW	Sunset Memorial Gardens	Irrigation	116	01/01/1968	-102.300555	31.88611	2883 ft (+)	View

Water Well Details *Lone Star Drum Facility*

BANKS ENVIRONMENTAL DATA A DIVISION OF THE BANKS GROUP

Map ID	Source ID	Dataset	Owner of Well	Type of Well	Depth Drilled	Completion Date	Longitude	Latitude	Elevation	Driller's Logs
41	WIID318031	TX TWDB WIID	Bill Satler	Irrigation	85	3/22/2013	-102.3	31.88361	2881 ft (-2)	View
42	45-06-914	TX TWDB GW	New Life Church Well #3	Plugged or Destroyed	112	08/21/1989	-102.288333	31.887499	2870 ft (-13)	View
43	45-06-8	TX TCEQ HIST	Lenora Pike	Domestic	110	08/26/1986	-102.300976	31.884909	2883 ft ()	View
44	WIID142005	TX TWDB WIID	Pradon Construction	Domestic	110	4/16/2008	-102.29111	31.880832	2876 ft (-7)	View
45	WIID262160	TX TWDB WIID	Jimmy Sanders	Domestic	110	8/13/2011	-102.300555	31.888888	2881 ft (-2)	View
46	WIID347787	TX TWDB WIID	Permian Homes	Domestic	115	10/18/2013	-102.292777	31.891944	2876 ft (-7)	View
47	45-06-8	TX TCEQ HIST	Lewie Montgomery	Domestic	114	09/29/1975	-102.301596	31.886762	2884 ft (+)	View
48	45-06-906	TX TWDB GW	Odessa Country Club	Irrigation	135	n/a	-102.288333	31.889444	2870 ft (-13)	View
49	45-06-8NN	TX TCEQ HIST	Jean Pike	Domestic	115	09/30/1978	-102.301666	31.884726	2883 ft ()	View
50	WIID294305	TX TWDB WIID	Rhonda Krogh	Domestic	110	6/21/2012	-102.301944	31.886944	2884 ft (+1)	View
51	WIID296304	TX TWDB WIID	CLAY MCFADDEN	Irrigation	90	8/10/2012	-102.301944	31.887221	2884 ft (+1)	View
51	WIID296698	TX TWDB WIID	Rick Gibson	Domestic	115	7/13/2012	-102.302222	31.887221	2884 ft (+1)	View
52	45-06-8	TX TCEQ HIST	Julio Nunez Jr.	Domestic	108	09/05/1997	-102.299653	31.881104	2877 ft (-6)	View
52	45-06-8	TX TCEQ HIST	Julio Nunez, Jr.	Domestic	102	09/05/1997	-102.299514	31.881155	2877 ft (-6)	View
53	WIID274586	TX TWDB WIID	Roger Clayton	Domestic	105	11/14/2011	-102.301666	31.883333	2882 ft (-1)	View
53	WIID274591	TX TWDB WIID	Roger Stone	Domestic	110	11/14/2011	-102.301666	31.883333	2882 ft (-1)	View
54	WIID294352	TX TWDB WIID	Bobby Cox Properties	Domestic	120	6/30/2012	-102.294444	31.892777	2879 ft (-4)	View
55	WIID291297	TX TWDB WIID	Bobby Cox	Domestic	120	5/9/2012	-102.296666	31.892499	2882 ft (-1)	View
56	WIID347789	TX TWDB WIID	Permian Homes	Domestic	115	10/22/2013	-102.29111	31.892221	2874 ft (-10)	View
56	WIID347790	TX TWDB WIID	Permian Homes	Domestic	115	10/22/2013	-102.29111	31.892221	2874 ft (-10)	View
57	45-06-806	TX TWDB GW	Odessa Country Club	Irrigation	135	n/a	-102.292777	31.892777	2876 ft (-7)	View
58	WIID58154	TX TWDB WIID	Darrel Farris	Domestic	111	4/29/2005	-102.300555	31.890555	2884 ft (+1)	View
59	WIID286184	TX TWDB WIID	CORY BIZZELL	Irrigation	70	4/17/2012	-102.302222	31.88361	2882 ft (-1)	View
60	WIID315334	TX TWDB WIID	David Johnston	Irrigation	110	3/15/2013	-102.297777	31.879443	2876 ft (-7)	View
61	WIID294304	TX TWDB WIID	Greg Hand	Domestic	110	6/21/2012	-102.302777	31.886388	2884 ft (+1)	View
61	WIID302974	TX TWDB WIID	DOUG MILLICAN	Irrigation	104	10/24/2012	-102.302777	31.886388	2884 ft (+1)	View
61	WIID302977	TX TWDB WIID	JUAN VILLAREAL	Irrigation	104	10/24/2012	-102.302777	31.886388	2884 ft (+1)	View
62	WIID299888	TX TWDB WIID	Mark Bickers	Domestic	117	8/29/2012	-102.301388	31.889999	2885 ft (+2)	View

Well Summary

Water Well Dataset	# of Wells
TX TCEQ HIST	14
TX TCEQ PWS	4
TX TWDB GW	18
TX TWDB WIID	35
Total Count	**71**

Appendix C

EPA ERT SOP 2012 Soil Sampling

U. S. EPA ENVIRONMENTAL RESPONSE TEAM

STANDARD OPERATING PROCEDURES

SOIL SAMPLING

CONTENTS

SUPERCEDES: SOP #2012; Revision 0.0; 11/16/94; U.S. EPA Contract 68-C4-0022.

SOIL SAMPLING

1.0 SCOPE AND APPLICATION

The purpose of this standard operating procedure (SOP) is to describe the procedures for the collection of representative soil samples. Sampling depths are assumed to be those that can be reached without the use of a drill rig, direct-push, or other mechanized equipment (except for a back-hoe). Analysis of soil samples may determine whether concentrations of specific pollutants exceed established action levels, or if the concentrations of pollutants present a risk to public health, welfare, or the environment.

These are standard (i.e., typically applicable) operating procedures which may be varied or changed as required, dependent upon site conditions, equipment limitations or limitations imposed by the procedure. In all instances, the actual procedures used should be documented and described in an appropriate site report.

Mention of trade names or commercial products does not constitute U.S. Environmental Protection Agency (EPA) endorsement or recommendation for use.

2.0 METHOD SUMMARY

Soil samples may be collected using a variety of methods and equipment depending on the depth of the desired sample, the type of sample required (disturbed vs. undisturbed), and the soil type. Near-surface soils may be easily sampled using a spade, trowel, and scoop. Sampling at greater depths may be performed using a hand auger, continuous flight auger, a trier, a split-spoon, or, if required, a backhoe.

3.0 SAMPLE PRESERVATION, CONTAINERS, HANDLING, AND STORAGE

Chemical preservation of solids is not generally recommended. Samples should, however, be cooled and protected from sunlight to minimize any potential reaction. The amount of sample to be collected and proper sample container type are discussed in ERT/REAC SOP #2003 Rev. 0.0 08/11/94, *Sample Storage, Preservation and Handling*.

4.0 INTERFERENCES AND POTENTIAL PROBLEMS

There are two primary potential problems associated with soil sampling - cross contamination of samples and improper sample collection. Cross contamination problems can be eliminated or minimized through the use of dedicated sampling equipment. If this is not possible or practical, then decontamination of sampling equipment is necessary. Improper sample collection can involve using contaminated equipment, disturbance of the matrix resulting in compaction of the sample, or inadequate homogenization of the samples where required, resulting in variable, non-representative results.

5.0 EQUIPMENT

Soil sampling equipment includes the following:

- Maps/plot plan
- Safety equipment, as specified in the site-specific Health and Safety Plan
- Survey equipment or global positioning system (GPS) to locate sampling points
- Tape measure
- Survey stakes or flags
- Camera and film
- Stainless steel, plastic, or other appropriate homogenization bucket, bowl or pan
- Appropriate size sample containers
- Ziplock plastic bags
- Logbook
- Labels
- Chain of Custody records and custody seals
- Field data sheets and sample labels
- Cooler(s)
- Ice
- Vermiculite
- Decontamination supplies/equipment
- Canvas or plastic sheet
- Spade or shovel
- Spatula
- Scoop
- Plastic or stainless steel spoons
- Trowel(s)
- Continuous flight (screw) auger
- Bucket auger
- Post hole auger
- Extension rods
- T-handle
- Sampling trier
- Thin wall tube sampler
- Split spoons
- Vehimeyer soil sampler outfit
  - Tubes
  - Points
  - Drive head
  - Drop hammer
  - Puller jack and grip
- Backhoe

6.0 REAGENTS

Reagents are not used for the preservation of soil samples. Decontamination solutions are specified in ERT/REAC SOP #2006 Rev. 0.0 08/11/94, *Sampling Equipment Decontamination*, and the site specific work plan.

7.0 PROCEDURES

7.1 Preparation

1. Determine the extent of the sampling effort, the sampling methods to be employed, and the types and amounts of equipment and supplies required.

2. Obtain necessary sampling and monitoring equipment.

3. Decontaminate or pre-clean equipment, and ensure that it is in working order.

4. Prepare schedules and coordinate with staff, client, and regulatory agencies, if appropriate.

5. Perform a general site survey prior to site entry in accordance with the site specific Health and Safety Plan.

6. Use stakes, flagging, or buoys to identify and mark all sampling locations. Specific site factors, including extent and nature of contaminant, should be considered when selecting sample location. If required, the proposed locations may be adjusted based on site access, property boundaries, and surface obstructions. All staked locations should be utility-cleared by the property owner or the On-Scene-Coordinator (OSC) prior to soil sampling; and utility clearance should always be confirmed before beginning work.

7.2 Sample Collection

7.2.1 Surface Soil Samples

Collection of samples from near-surface soil can be accomplished with tools such as spades, shovels, trowels, and scoops. Surface material is removed to the required depth and a stainless steel or plastic scoop is then used to collect the sample.

This method can be used in most soil types but is limited to sampling at or near the ground surface. Accurate, representative samples can be collected with this procedure depending on the care and precision demonstrated by the sample team member. A flat, pointed mason trowel to cut a block of the desired soil is helpful when undisturbed profiles are required. Tools plated with chrome or other materials should not be used. Plating is particularly common with garden implements such as potting trowels.

The following procedure is used to collect surface soil samples:

1. Carefully remove the top layer of soil or debris to the desired sample depth with a pre-cleaned spade.

2. Using a pre-cleaned, stainless steel scoop, plastic spoon, or trowel, remove and discard a thin layer of soil from the area which came in contact with the spade.

3. If volatile organic analysis is to be performed, transfer the sample directly into an appropriate, labeled sample container with a stainless steel lab spoon, or equivalent and secure the cap tightly. Place the remainder of the sample into a stainless steel, plastic, or other appropriate homogenization container, and mix thoroughly to obtain a homogenous sample representative of the entire sampling interval. Then, either place the sample into appropriate, labeled containers and secure the caps tightly; or, if composite samples are to be collected, place a sample from another sampling interval or location into the homogenization container and mix thoroughly. When compositing is complete, place the sample into appropriate, labeled containers and secure the caps tightly.

7.2.2 Sampling at Depth with Augers and Thin Wall Tube Samplers

This system consists of an auger, or a thin-wall tube sampler, a series of extensions, and a "T" handle (Figure 1, Appendix A). The auger is used to bore a hole to a desired sampling depth, and is then withdrawn. The sample may be collected directly from the auger. If a core sample is to be collected, the auger tip is then replaced with a thin wall tube sampler. The system is then lowered down the borehole, and driven into the soil to the completion depth. The system is withdrawn and the core is collected from the thin wall tube sampler.

Several types of augers are available; these include: bucket type, continuous flight (screw), and post-hole augers. Bucket type augers are better for direct sample recovery because they provide a large volume of sample in a short time. When continuous flight augers are used, the sample can be collected directly from the flights. The continuous flight augers are satisfactory when a composite of the complete soil column is desired. Post-hole augers have limited utility for sample collection as they are designed to cut through fibrous, rooted, swampy soil and cannot be used below a depth of approximately three feet.

The following procedure is used for collecting soil samples with the auger:

1. Attach the auger bit to a drill rod extension, and attach the "T" handle to the drill rod.

2. Clear the area to be sampled of any surface debris (e.g., twigs, rocks, litter). It may be advisable to remove the first three to six inches of surface soil for an area approximately six inches in radius around the drilling location.

3. Begin augering, periodically removing and depositing accumulated soils onto a plastic sheet spread near the hole. This prevents accidental brushing of loose material back down the borehole when removing the auger or adding drill rods. It also facilitates refilling the hole, and avoids possible contamination of the surrounding area.

4. After reaching the desired depth, slowly and carefully remove the auger from the hole. When sampling directly from the auger, collect the sample after the auger is removed from the hole and proceed to Step 10.

5. Remove auger tip from the extension rods and replace with a pre-cleaned thin wall tube sampler. Install the proper cutting tip.

6. Carefully lower the tube sampler down the borehole. Gradually force the tube sampler into the soil. Do not scrape the borehole sides. Avoid hammering the rods as the vibrations may cause the boring walls to collapse.

7. Remove the tube sampler, and unscrew the drill rods.

8. Remove the cutting tip and the core from the device.

9. Discard the top of the core (approximately 1 inch), as this possibly represents material collected before penetration of the layer of concern. Place the remaining core into the appropriate labeled sample container. Sample homogenization is not required.

10. If volatile organic analysis is to be performed, transfer the sample into an appropriate, labeled sample container with a stainless steel lab spoon, or equivalent and secure the cap tightly. Place the remainder of the sample into a stainless steel, plastic, or other appropriate homogenization container, and mix thoroughly to obtain a homogenous sample representative of the entire sampling interval. Then, either place the sample into appropriate, labeled containers and secure the caps tightly; or, if composite samples are to be collected, place a sample from another sampling interval into the homogenization container and mix thoroughly.

    When compositing is complete, place the sample into appropriate, labeled containers and secure the caps tightly.

11. If another sample is to be collected in the same hole, but at a greater depth, reattach the auger bit to the drill and assembly, and follow steps 3 through 11, making sure to decontaminate the auger and tube sampler between samples.

12. Abandon the hole according to applicable state regulations. Generally, shallow holes can simply be backfilled with the removed soil material.

7.2.3 Sampling with a Trier

The system consists of a trier, and a "T" handle. The auger is driven into the soil to be sampled and used to extract a core sample from the appropriate depth.

The following procedure is used to collect soil samples with a sampling trier:

1. Insert the trier (Figure 2, Appendix A) into the material to be sampled at a 0° to 45° angle from horizontal. This orientation minimizes the spillage of sample.

2. Rotate the trier once or twice to cut a core of material.

3. Slowly withdraw the trier, making sure that the slot is facing upward.

4. If volatile organic analyses are required, transfer the sample into an appropriate, labeled sample container with a stainless steel lab spoon, or equivalent and secure the cap tightly. Place the remainder of the sample into a stainless steel, plastic, or other appropriate homogenization container, and mix thoroughly to obtain a homogenous sample representative of the entire sampling interval. Then, either place the sample into appropriate, labeled containers and secure the caps tightly; or, if composite samples are to be collected, place a sample from another sampling interval into the homogenization container and mix thoroughly. When compositing is complete, place the sample into appropriate, labeled containers and secure the caps tightly.

7.2.4 Sampling at Depth with a Split Spoon (Barrel) Sampler

Split spoon sampling is generally used to collect undisturbed soil cores of 18 or 24 inches in length. A series of consecutive cores may be extracted with a split spoon sampler to give a complete soil column profile, or an auger may be used to drill down to the desired depth for sampling. The split spoon is then driven to its sampling depth through the bottom of the augured hole and the core extracted.

When split spoon sampling is performed to gain geologic information, all work should

be performed in accordance with ASTM D1586-98, "Standard Test Method for Penetration Test and Split-Barrel Sampling of Soils".

The following procedures are used for collecting soil samples with a split spoon:

1. Assemble the sampler by aligning both sides of barrel and then screwing the drive shoe on the bottom and the head piece on top.

2. Place the sampler in a perpendicular position on the sample material.

3. Using a well ring, drive the tube. Do not drive past the bottom of the head piece or compression of the sample will result.

4. Record in the site logbook or on field data sheets the length of the tube used to penetrate the material being sampled, and the number of blows required to obtain this depth.

5. Withdraw the sampler, and open by unscrewing the bit and head and splitting the barrel. The amount of recovery and soil type should be recorded on the boring log. If a split sample is desired, a cleaned, stainless steel knife should be used to divide the tube contents in half, longitudinally. This sampler is typically available in 2 and 3 1/2 inch diameters. A larger barrel may be necessary to obtain the required sample volume.

6. Without disturbing the core, transfer it to appropriate labeled sample container(s) and seal tightly.

7.2.5 Test Pit/Trench Excavation

A backhoe can be used to remove sections of soil, when detailed examination of soil characteristics are required. This is probably the most expensive sampling method because of the relatively high cost of backhoe operation.

The following procedures are used for collecting soil samples from test pits or trenches:

1. Prior to any excavation with a backhoe, it is important to ensure that all sampling locations are clear of overhead and buried utilities.

2. Review the site specific Health & Safety plan and ensure that all safety precautions including appropriate monitoring equipment are installed as required.

3. Using the backhoe, excavate a trench approximately three feet wide and approximately one foot deep below the cleared sampling location. Place excavated soils on plastic sheets. Trenches greater than five feet deep must be sloped or protected by a shoring system, as required by OSHA regulations.

4. A shovel is used to remove a one to two inch layer of soil from the vertical face of the pit where sampling is to be done.

5. Samples are taken using a trowel, scoop, or coring device at the desired intervals. Be sure to scrape the vertical face at the point of sampling to remove any soil that may have fallen from above, and to expose fresh soil for sampling. In many instances, samples can be collected directly from the backhoe bucket.

6. If volatile organic analyses are required, transfer the sample into an appropriate, labeled sample container with a stainless steel lab spoon, or equivalent and secure the cap tightly. Place the remainder of the sample into a stainless steel, plastic, or other appropriate homogenization container, and mix thoroughly to obtain a homogenous sample representative of the entire sampling interval. Then, either place the sample into appropriate, labeled containers and secure the caps tightly; or, if composite samples are to be collected, place a sample from another sampling interval into the homogenization container and mix thoroughly. When compositing is complete, place the sample into appropriate, labeled containers and secure the caps tightly.

7. Abandon the pit or excavation according to applicable state regulations. Generally, shallow excavations can simply be backfilled with the removed soil material.

8.0 CALCULATIONS

This section is not applicable to this SOP.

9.0 QUALITY ASSURANCE/QUALITY CONTROL

There are no specific quality assurance (QA) activities which apply to the implementation of these procedures. However, the following QA procedures apply:

1. All data must be documented on field data sheets or within site logbooks.

2. All instrumentation must be operated in accordance with operating instructions as supplied by the manufacturer, unless otherwise specified in the work plan. Equipment checkout and calibration

activities must occur prior to sampling/operation, and they must be documented.

10.0 DATA VALIDATION

This section is not applicable to this SOP.

11.0 HEALTH AND SAFETY

When working with potentially hazardous materials, follow U.S. EPA, OHSA and corporate health and safety procedures, in addition to the procedures specified in the site specific Health & Safety Plan..

12.0 REFERENCES

Mason, B.J. 1983. Preparation of Soil Sampling Protocol: Technique and Strategies. EPA-600/4-83-020.

Barth, D.S. and B.J. Mason. 1984. Soil Sampling Quality Assurance User's Guide. EPA-600/4-84-043.

U.S. Environmental Protection Agency. 1984 Characterization of Hazardous Waste Sites - A Methods Manual: Volume II. Available Sampling Methods, Second Edition. EPA-600/4-84-076.

de Vera, E.R., B.P. Simmons, R.D. Stephen, and D.L. Storm. 1980. Samplers and Sampling Procedures for Hazardous Waste Streams. EPA-600/2-80-018.

ASTM D 1586-98, ASTM Committee on Standards, Philadelphia, PA.

APPENDIX A
Figures
SOP #2012
February 2000

FIGURE 1. Sampling Augers

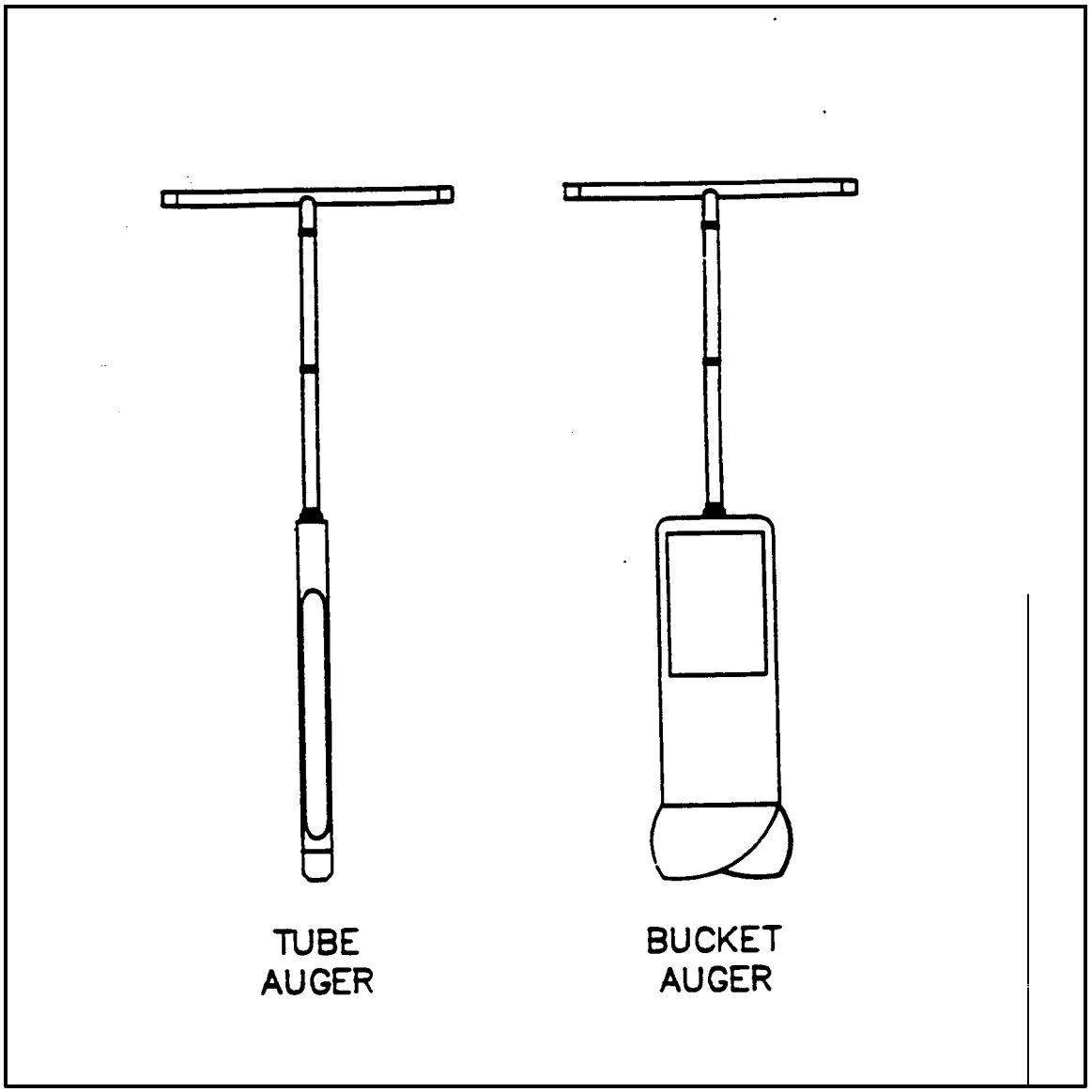
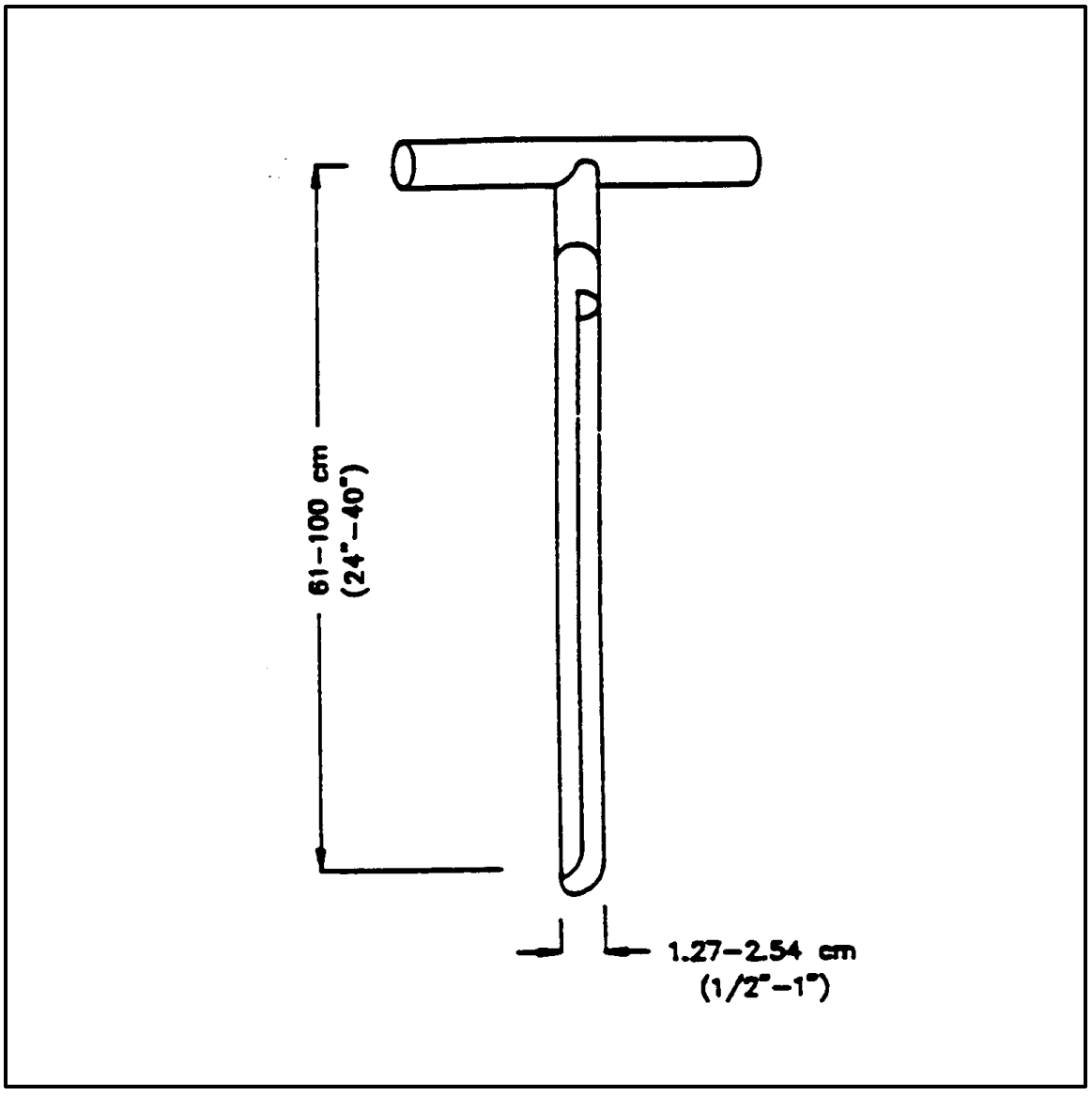


FIGURE 2. Sampling Trier



Appendix D

EPA ERT SOP 2009 Drum Sampling

DRUM SAMPLING

SOP#: 2009
DATE: 11/16/94
REV. #: 0.0

1.0 SCOPE AND APPLICATION

The purpose of this standard operating procedure (SOP) is to provide technical guidance on implementing safe and cost-effective response actions at hazardous waste sites containing drums with unknown contents. Container contents are sampled and characterized for disposal, bulking, recycling, segregation, and classification purposes.

These are standard (i.e., typically applicable) operating procedures which may be varied or changed as required, dependent on site conditions, equipment limitations or limitations imposed by the procedure. In all instances, the ultimate procedures employed should be documented and associated with the final report.

Mention of trade names or commercial products does not constitute U.S. Environmental Protection Agency (U.S. EPA) endorsement or recommendation for use.

2.0 METHOD SUMMARY

Prior to sampling, drums must be excavated, (if necessary), inspected, staged, and opened. Drum excavation must be performed by qualified personnel. Inspection involves the observation and recording of visual qualities of each drum and any characteristics pertinent to the classification of the drum's contents. Staging involves the physical grouping of drums according to classifications established during the physical inspection. Opening of closed drums can be performed manually or remotely. Remote drum opening is recommended for worker safety. The most widely used method of sampling a drum involves the use of a glass thief. This method is quick, simple, relatively inexpensive, and requires no decontamination. The contents of a drum can be further characterized by performing various field tests.

3.0 SAMPLE PRESERVATION, CONTAINERS, HANDLING, AND STORAGE

Samples collected from drums are considered waste samples and as such, adding preservatives is not required due to the potential reaction of the sample with the preservative. Samples should, however, be cooled to 4°C and protected from sunlight in order to minimize any potential reaction due to the light sensitivity of the sample.

Sample bottles for collection of waste liquids, sludges, or solids are typically wide mouth amber jars with Teflon-lined screw caps. Actual volume required for analysis should be determined in conjunction with the laboratory performing the analysis.

Waste sample handling procedures should be as follows:

1. Label the sample container with the appropriate sample label and complete the appropriate field data sheet(s). Place sample container into two resealable plastic bags.

2. Place each bagged sample container into a shipping container which has been lined with plastic. Pack the container with enough non-combustible, absorbent, cushioning material to minimize the possibility of containers breaking, and to absorb any material which may leak.

   Note: Depending on the nature and quantity of the material to be shipped, different packaging may be required. The transportation company or a shipping/receiving expert should be consulted prior to packing the samples.

3. Complete a chain of custody record for each shipping container, place into a resealable

plastic bag, and affix to the inside lid of the shipping container.

4. Secure and custody seal the lid of the shipping container. Label the shipping container appropriately and arrange for the appropriate transportation mode consistent with the type of hazardous waste involved.

4.0 INTERFERENCES AND POTENTIAL PROBLEMS

If buried drums are suspected, geophysical investigation techniques such as magnetometry or ground penetrating radar may be employed in an attempt to determine the location and depth of drums. During excavation, the soil must be removed with great caution to minimize the potential for drum rupture.

Until the contents are characterized, sampling personnel should assume that unlabelled drums contain hazardous materials. Labelled drums are frequently mislabelled, especially drums that are reused. Because a drum's label may not accurately describe its contents, extreme caution must be exercised when working with or around drums.

If a drum which contains a liquid cannot be moved without rupture, its contents may be immediately transferred to a sound drum using an appropriate method of transfer based on the type of waste. In any case, preparations should be made to contain the spill (i.e., spill pads, dike, etc.) should one occur.

If a drum is leaking, open, or deteriorated, then it must be placed immediately in overpack containers.

The practice of tapping drums to determine their contents is neither safe nor effective and should not be used if the drums are visually overpressurized or if shock-sensitive materials are suspected. A laser thermometer may be effective in order to determine the level of the drum contents via surface temperature differences.

Drums that have been overpressurized to the extent that the head is swollen several inches above the level of the chime should not be moved. A number of devices have been developed for venting critically swollen drums. One method that has proven to be effective is a tube and spear device. A light aluminum tube (3 meters long) is positioned at the vapor space of the drum. A rigid, hooking device attached to the tube, goes over the chime and holds the tube securely in place. The spear is inserted in the tube and positioned against the drum wall. A sharp blow on the end of the spear drives the sharpened tip through the drum and the gas vents along the grooves. Venting should be done from behind a wall or barricade. Once the pressure has been relieved, the bung can be removed and the drum sampled.

Because there is potential for accidents to occur during handling, particularly initial handling, drums should only be handled if necessary. All personnel should be warned of the hazards prior to handling drums. Overpack drums and an adequate volume of absorbent material should be kept near areas where minor spills may occur. Where major spills may occur, a containment berm adequate to contain the entire volume of liquid in the drums should be constructed before any handling takes place. If drum contents spill, personnel trained in spill response should be used to isolate and contain the spill.

5.0 EQUIPMENT/APPARATUS

The following are standard materials and equipment required for sampling:

- Personal protection equipment
- Wide-mouth amber glass jars with Teflon cap liner, approximately 500 mL volume
- Other appropriate sample jars
- Uniquely numbered sample identification labels with corresponding data sheets
- Drum/Tank Sampling Data Sheets and Field Test Data Sheets for Drum/Tank Sampling
- Chain of Custody records
- Decontamination materials
- Glass thieving tubes or COLIWASA
- Coring device
- Stainless steel spatula or spoons
- Laser thermometer
- Drum overpacks
- Absorbent material for spills
- Drum opening devices

Bung Wrench

A common method for opening drums manually is using a universal bung wrench. These wrenches have fittings made to

remove nearly all commonly encountered bungs. They are usually constructed of a non-sparking metal alloy (i.e., brass, bronze/manganese, aluminum, etc.) formulated to reduce the likelihood of sparks. The use of a "NON-SPARKING" wrench does not completely eliminate the possibility of a spark being produced.

Drum Deheader

One means by which a drum can be opened manually when a bung is not removable with a bung wrench is by using a drum deheader. This tool is constructed of forged steel with an alloy steel blade and is designed to cut the lid of a drum off or part way off by means of a scissors-like cutting action. A limitation of this device is that it can be attached only to closed head drums. Drums with removable heads must be opened by other means.

Hand Pick, Pickaxe, and Hand Spike

These tools are usually constructed of brass or a non-sparking alloy with a sharpened point that can penetrate the drum lid or head when the tool is swung. The hand picks or pickaxes that are most commonly used are commercially available; whereas, the spikes are generally uniquely fabricated four foot long poles with a pointed end.

Backhoe Spike

Another means used to open drums remotely for sampling is a metal spike attached or welded to a backhoe bucket. This method is very efficient and is often used in large-scale operations.

Hydraulic Drum Opener

Recently, remotely operated hydraulic devices have been fabricated to open drums. This device uses hydraulic pressure to force a non-sparking spike through the wall of a drum. It consists of a manually operated pump which pressurizes fluid through a length of hydraulic line.

Pneumatic Devices

A pneumatic bung remover consists of a compressed air supply that is controlled by a two-stage regulator. A high pressure air line of desired length delivers compressed air to a pneumatic drill, which is adapted to turn bung fitting selected to fit the bung to be removed. An adjustable bracketing system has been designed to position and align the pneumatic drill over the bung. This bracketing system must be attached to the drum before the drill can be operated. Once the bung has been loosened, the bracketing system must be removed before the drum can be sampled. This remote bung opener does not permit the slow venting of the container, and therefore appropriate precautions must be taken. It also requires the container to be upright and relatively level. Bungs that are rusted shut cannot be removed with this device.

6.0 REAGENTS

Reagents are not typically required for preserving drum samples. However, reagents will be utilized for decontamination of sampling equipment.

7.0 PROCEDURES

7.1 Preparation

1. Determine the extent of the sampling effort, the sampling methods to be employed, and the types and amounts of equipment and supplies needed.

2. Obtain necessary sampling and monitoring equipment.

3. Decontaminate or preclean equipment, and ensure that it is in working order.

4. Prepare scheduling and coordinate with staff, clients, and regulatory agency, if appropriate.

5. Perform a general site survey prior to site entry in accordance with the site specific Health and Safety Plan.

6. Use stakes, flagging, or buoys to identify and mark all sampling locations. If required the proposed locations may be adjusted based on site access, property boundaries, and surface obstructions.

7.2 Drum Excavation

If it is presumed that buried drums are on-site and prior to beginning excavation activities, geophysical investigation techniques should be utilized to approximate the location and depth of the drums. In addition, it is important to ensure that all locations where excavation will occur are clear of utility lines, pipes and poles (subsurface as well as above surface).

Excavating, removing, and handling drums are generally accomplished with conventional heavy construction equipment. These activities should be performed by an equipment operator who has experience in drum excavation. During excavation activities, drums must be approached in a manner that will avoid digging directly into them.

The soil around the drum should be excavated with non-sparking hand tools or other appropriate means and as the drums are exposed, a visual inspection should be made to determine the condition of the drums. Ambient air monitoring should be done to determine the presence of unsafe levels of volatile organics, explosives, or radioactive materials. Based on this preliminary visual inspection, the appropriate mode of drum excavation and handling may be determined.

Drum identification and inventory should begin before excavation. Information such as location, date of removal, drum identification number, overpack status, and any other identification marks should be recorded on the Drum/Tank Sampling Data Sheet (Attachment 1, Appendix A).

7.3 Drum Inspection

Appropriate procedures for handling drums depend on the contents. Thus, prior to any handling, drums should be visually inspected to gain as much information as possible about their contents. The drums should be inspected for the following:

1. Drum condition, corrosion, rust, punctures, bungs, and leaking contents.

2. Symbols, words, or other markings on the drum indicating hazards (i.e., explosive, radioactive, toxic, flammable), or further identifying the drums.

3. Signs that the drum is under pressure.

4. Shock sensitivity.

Monitoring should be conducted around the drums using instruments such as radiation meters, organic vapor analyzers (OVA) and combustible gas indicators (CGI).

Survey results can be used to classify the drums into categories, for instance:

- Radioactive
- Leaking/deteriorating
- Bulging
- Lab packs
- Explosive/shock sensitive
- Empty

All personnel should assume that unmarked drums contain hazardous materials until their contents have been categorized. Once a drum has been visually inspected and any immediate hazard has been eliminated by overpacking or transferring the drum's contents, the drum is affixed with a numbered tag and transferred to a staging area. Color-coded tags, labels or bands should be used to identify the drum's category based on visual inspection. A description of each drum, its condition, any unusual markings, the location where it was buried or stored, and field monitoring information are recorded on a Drum/Tank Sampling Data Sheet (Attachment 1, Appendix A). This data sheet becomes the principal record keeping tool for tracking the drum on-site.

7.4 Drum Staging

Prior to sampling, the drums should be staged to allow easy access. Ideally, the staging area should be located just far enough from the drum opening area to prevent a chain reaction if one drum should explode or catch fire when opened.

During staging, the drums should be physically separated into the following categories: those containing liquids, those containing solids, those containing lab packs, and those which are empty.

This is done because the strategy for sampling and handling drums/containers in each of these categories will be different. This may be achieved by visual inspection of the drum and its labels, codes, etc. Solids and sludges are typically disposed of in open top drums. Closed head drums with a bung opening generally contain liquid.

Where there is good reason to suspect that drums contain radioactive, explosive, or shock-sensitive materials, these drums should be staged in a separate, isolated area. Placement of explosives and shock-sensitive materials in diked and fenced areas will minimize the hazard and the adverse effects of any premature detonation of explosives.

Where space allows, the drum opening area should be physically separated from the drum removal and drum staging operations. Drums are moved from the staging area to the drum opening area one at a time using forklift trucks equipped with drum grabbers or a barrel grappler. In a large-scale drum handling operation, drums may be conveyed to the drum opening area using a roller conveyor. Drums may be restaged as necessary after opening and sampling.

7.5 Drum Opening

There are three basic techniques available for opening drums at hazardous waste sites:

- Manual opening with non-sparking bung wrenches
- Drum deheading
- Remote drum puncturing or bung removal

The choice of drum opening techniques and accessories depends on the number of drums to be opened, their waste contents, and physical condition. Remote drum opening equipment should always be considered in order to protect worker safety. Under OSHA 1910.120, manual drum opening with bung wrenches or deheaders should be performed ONLY with structurally sound drums and waste contents that are known to be non-shock sensitive, non-reactive, non-explosive, and non-flammable.

7.5.1 Manual Drum Opening with a Bung Wrench

Manual drum opening with bung wrenches (Figure 1, Appendix B) should not be performed unless the drums are structurally sound (no evidence of bulging or deformation) and their contents are known to be non-shock sensitive, non-reactive, non-explosive or non-flammable. If opening the drum with bung wrenches is deemed safe, then certain procedures should be implemented to minimize the hazard:

- Field personnel should be fully outfitted with protective gear.
- Drums should be positioned upright with the bung up, or, for drums with bungs on the side, laid on their sides with the bung plugs up.
- The wrenching motion should be a slow, steady pull across the drum. If the length of the bung wrench handle provides inadequate leverage for unscrewing the plug, a "cheater bar" can be attached to the handle to improve leverage.

7.5.2 Manual Drum Opening with a Drum Deheader

Drums are opened with a drum deheader (Figure 2, Appendix B) by first positioning the cutting edge just inside the top chime and then tightening the adjustment screw so that the deheader is held against the side of the drum. Moving the handle of the deheader up and down while sliding the deheader along the chime will enable the entire top to be rapidly cut off if so desired. If the top chime of a drum has been damaged or badly dented it may not be possible to cut the entire top off. Since there is always the possibility that a drum may be under pressure, the initial cut should be made very slowly to allow for the gradual release of any built-up pressure. A safer technique would be to employ a remote method prior to using the deheader.

Self-propelled drum openers which are either electrically or pneumatically driven are available and can be used for quicker and more efficient deheading.

The drum deheader should be decontaminated, as necessary, after each drum is opened to avoid cross contamination and/or adverse chemical reactions from incompatible materials.

7.5.3 Manual Drum Opening with a Hand Pick, Pickaxe, or Spike

When a drum must be opened and neither a bung

wrench nor a drum deheader is suitable, then it can be opened for sampling by using a hand pick, pickaxe, or spike (Figure 3, Appendix B). Often the drum lid or head must be hit with a great deal of force in order to penetrate it. Because of this, the potential for splash or spraying is greater than with other opening methods and therefore, this method of drum opening is not recommended, particularly when opening drums containing liquids. Some spikes used have been modified by the addition of a circular splash plate near the penetrating end. This plate acts as a shield and reduces the amount of splash in the direction of the person using the spike. Even with this shield, good splash gear is essential.

Since drums, some of which may be under pressure, cannot be opened slowly with these tools, spray from drums is common and appropriate safety measures must be taken. The pick or spike should be decontaminated after each drum is opened to avoid cross contamination and/or adverse chemical reaction from incompatible materials.

7.5.4 Remote Drum Opening with a Backhoe Spike

Remotely operated drum opening tools are the safest available means of drum opening. Remote drum opening is slow, but provides a high degree of safety compared to manual methods of opening.

In the opening area, drums should be placed in rows with adequate aisle space to allow ease in backhoe maneuvering. Once staged, the drums can be quickly opened by punching a hole in the drum head or lid with the spike.

The spike (Figure 4, Appendix B) should be decontaminated after each drum is opened to prevent cross contamination and/or adverse reaction from incompatible material. Even though some splash or spray may occur when this method is used, the operator of the backhoe can be protected by mounting a large shatter-resistant shield in front of the operator's cage. This combined with the normal personal protection gear should be sufficient to protect the operator. Additional respiratory protection can be afforded by providing the operator with an on-board airline system.

7.5.5 Remote Drum Opening with Hydraulic Devices

A piercing device with a non-sparking, metal point is attached to the end of a hydraulic line and is pushed into the drum by the hydraulic pressure (Figure 5, Appendix B). The piercing device can be attached so that a hole for sampling can be made in either the side or the head of the drum. Some of the metal piercers are hollow or tube-like so that they can be left in place if desired and serve as a permanent tap or sampling port. The piercer is designed to establish a tight seal after penetrating the container.

7.5.6 Remote Drum Opening with Pneumatic Devices

Pneumatically-operated devices utilizing compressed air have been designed to remove drum bungs remotely (Figure 6, Appendix B). Prior to opening the drum, a bung fitting must be selected to fit the bung to be removed. The adjustable bracketing system is then attached to the drum and the pneumatic drill is aligned over the bung. This must be done before the drill can be operated. The operator then moves away from the drum to operate the equipment. Once the bung has been loosened, the bracketing system must be removed before the drum can be sampled. This remote bung opener does not permit the slow venting of the container, and therefore appropriate precautions must be taken. It also requires the container to be upright and relatively level. Bungs that are rusted shut cannot be removed with this device.

7.6 Drum Sampling

After the drum has been opened, preliminary monitoring of headspace gases should be performed first with an explosimeter/oxygen meter. Afterwards, an OVA or other instruments should be used. If possible, these instruments should be intrinsically safe. In most cases it is impossible to observe the contents of these sealed or partially sealed drums. Since some layering or stratification is likely in any solution left undisturbed, a sample that represents the entire depth of the drum must be taken.

When sampling a previously sealed drum, a check should be made for the presence of a bottom sludge. This is easily accomplished by measuring the depth to apparent bottom then comparing it to the known interior depth.

7.6.1 Glass Thief Sampler

The most widely used implement for sampling drum liquids is a glass tube commonly referred to as a glass thief (Figure 7, Appendix B). This tool is cost effective, quick, and disposable. Glass thieves are typically 6mm to 16mm I.D. and 48 inches long.

Procedures for Use:

1. Remove the cover from the sample container.

2. Insert glass tubing almost to the bottom of the drum or until a solid layer is encountered. About one foot of tubing should extend above the drum.

3. Allow the waste in the drum to reach its natural level in the tube.

4. Cap the top of the sampling tube with a tapered stopper or thumb, ensuring liquid does not come into contact with stopper.

5. Carefully remove the capped tube from the drum and insert the uncapped end into the appropriate sample container.

6. Release stopper and allow the glass thief to drain until the container is approximately two-thirds full.

7. Remove tube from the sample container, break it into pieces and place the pieces in the drum.

8. Cap the sample container tightly and label it. Place the sample container into a carrier.

9. Replace the bung or place plastic over the drum.

10. Log all samples in the site logbook and on Drum/Tank Sampling Data Sheets.

11. Perform hazard categorization analyses if included in the project scope.

12. Transport the sample to the decontamination zone and package it for transport to the analytical laboratory, as necessary. Complete chain of custody records.

In many instances a drum containing waste material will have a sludge layer on the bottom. Slow insertion of the sample tube into this layer; then a gradual withdrawal will allow the sludge to act as a bottom plug to maintain the fluid in the tube. The plug can be gently removed and placed into the sample container by the use of a stainless steel lab spoon.

It should be noted that in some instances disposal of the tube by breaking it into the drum may interfere with eventual plans for the removal of its contents. The use of this technique should be cleared with the project officer or other glass thief disposal techniques should be evaluated.

7.6.2 COLIWASA Sampler

The Composite Liquid Waste Sampler (COLIWASA) and modifications thereof are equipment that collect a sample from the full depth of a drum and maintain it in the transfer tube until delivery to the sample bottle. The COLIWASA (Figure 8, Appendix B) is a much cited sampler designed to permit representative sampling of multiphase wastes from drums and other containerized wastes. One configuration consists of a 152 cm by 4 cm I.D. section of tubing with a neoprene stopper at one end attached by a rod running the length of the tube to a locking mechanism at the other end.

Manipulation of the locking mechanism opens and closes the sampler by raising and lowering the neoprene stopper. One model of the COLIWASA is shown in Appendix B; however, the design can be modified and/or adapted somewhat to meet the needs of the sampler.

The major drawbacks associated with using a COLIWASA concern decontamination and costs. The sampler is difficult to decontaminate in the field and its high cost in relation to alternative procedures (glass tubes) make it an impractical throwaway item. It still has applications, however, especially in instances where a true representation of a multiphase waste is absolutely necessary.

Procedures for Use

1. Put the sampler in the open position by placing the stopper rod handle in the T-position and pushing the rod down until the handle sits against the sampler's locking block.

2. Slowly lower the sampler into the liquid waste. Lower the sampler at a rate that permits the levels of the liquid inside and outside the sampler tube to be about the same. If the level of the liquid in the sample tube is lower than that outside the sampler, the sampling rate is too fast and will result in a non-representative sample.

3. When the sampler stopper hits the bottom of the waste container, push the sampler tube downward against the stopper to close the sampler. Lock the sampler in the closed position by turning the T-handle until it is upright and one end rests tightly on the locking block.

4. Slowly withdraw the sample from the waste container with one hand while wiping the sampler tube with a disposable cloth or rag with the other hand.

5. Carefully discharge the sample into the appropriate sample container by slowly pulling the lower end of the T-handle away from the locking block while the lower end of the sampler is positioned in a sample container.

6. Cap the sample container tightly and label it. Place the sample container in a carrier.

7. Replace the bung or place plastic over the drum.

8. Log all samples in the site logbook and on Drum/Tank Sampling Data Sheets.

9. Perform hazard categorization analyses if included in the project scope.

10. Transport the sample to the decontamination zone and package for transport to the analytical laboratory, as necessary. Complete the Chain of Custody records.

7.6.3 Coring Device

A coring device may be used to sample drum solids. Samples should be taken from different areas within the drum. This sampler consists of a series of extensions, a T- handle, and the coring device.

Procedures for use:

1. Assemble the sampling equipment.

2. Remove the cover from the sample container.

3. Insert the sampling device to the bottom of the drum. The extensions and the "T" handle should extend above the drum.

4. Rotate the sampling device to cut a core of material.

5. Slowly withdraw the sampling device so that as much sample material as possible is retained within it.

6. Transfer the sample to the appropriate sample container, and label it. A stainless steel spoon or scoop may be used as necessary.

7. Cap the sample container tightly and place it in a carrier.

8. Replace the bung or place plastic over the drum.

9. Log all samples in the site log book and on Drum/Tank Sampling Data Sheets.

10. Perform hazard categorization analyses if included in the project scope.

11. Transport the sample to the decontamination zone and package it for transport to the analytical laboratory, as necessary. Complete chain of custody records.

7.7 Hazard Categorization

The goal of characterizing or categorizing the contents of drums is to obtain a quick, preliminary assessment of the types and levels of pollutants contained in the drums. These activities generally involve rapid, non-rigorous methods of analysis. The data obtained from these methods can be used to make decisions regarding drum staging or restaging, bulking or compositing of the drum contents.

As a first step in obtaining these data, standard tests should be used to classify the drum contents into general categories such as auto-reactives, water reactives, inorganic acids, organic acids, heavy metals, pesticides, cyanides, inorganic oxidizers, and organic oxidizers. In some cases, further analyses should be conducted to more precisely identify the drum contents.

There are several methods available to perform these tests:

- the HazCat^{R} chemical identification system
- the Chlor-N-Oil Test Kit
- Spill-fyter Chemical Classifier Strips
- Setaflash (for ignitability)

These methods must be performed according to the manufacturers' instructions and the results must be documented on the Field Test Data Sheet for Drum/Tank Sampling (Attachment 2, Appendix A).

Other tests which may be performed include:

- Water Reactivity
- Specific Gravity Test (compared to water)
- Water Solubility Test
- pH of Aqueous Solution

The tests must be performed in accordance with the instructions on the Field Test Data Sheet for Drum/Tank Sampling and results of the tests must be documented on these data sheets.

The specific methods that will be used for hazard categorization must be documented in the Quality Assurance Work Plan.

8.0 CALCULATIONS

This section is not applicable to this SOP.

9.0 QUALITY ASSURANCE/ QUALITY CONTROL

The following general quality assurance procedures apply:

1. All data must be documented on Chain of Custody records, Drum/Tank Sampling Data Sheets, Field Test Data Sheet for Drum/Tank Sampling, or within site logbooks.

2. All instrumentation must be operated in accordance with operating instructions as supplied by the manufacturer, unless otherwise specified in the work plan. Equipment checkout and calibration activities must occur prior to sampling/operation, and they must be documented.

10.0 DATA VALIDATION

This section is not applicable to this SOP.

11.0 HEALTH AND SAFETY

When working with potentially hazardous materials, follow U.S. EPA, OSHA, and corporate health and safety procedures.

More specifically, the opening of closed containers is one of the most hazardous site activities. Maximum efforts should be made to ensure the safety of the sampling team. Proper protective equipment and a general awareness of the possible dangers will minimize the risk inherent to sampling operations. Employing proper drum opening techniques and equipment will also safeguard personnel. The use of remote sampling equipment whenever feasible is highly recommended.

12.0 REFERENCES

Guidance Document for Cleanup of Surface Tank and Drum Sites, OSWER Directive 9380.0-3.

Drum Handling Practices at Hazardous Waste Sites, EPA-600/2-86-013.

APPENDIX A

Attachments

ATTACHMENT 1. Drum/Tank Sampling Data Sheet

Samplers: _____ Date: _____

Site Name: _____ Work Order Number: 3347-040-001-_____

Container Number/Sample Number: _____ REAC Task Leader: _____

SITE INFORMATION:

1. Terrain, drainage description:_____

2. Weather conditions (from observation):_____

MET station on site: No Yes

CONTAINER INFORMATION:

1. Container type: Drum Tank Other:_____

2. Container dimensions: Shape:_____

Approximate size:_____

3. Label present: No
Yes:_____

Other Markings: _____
_____
_____
_____

4. Spill or leak present: No Yes Dimensions:_____

5. Container location: (Circle one) N/A See Map Other: _____
_____
_____
_____
_____
_____

APPENDIX A (Cont'd)

Attachments

ATTACHMENT 1. Drum/Tank Sampling Data Sheet (cont'd)

SAMPLE INFORMATION:

1. Description: _____ liquid _____ solid (_____ powder or _____ crystals) _____ sludge

2. Color: _____ Vapors:_____
   Other:_____

3. Local effects present: (damage - environmental, material)_____

FIELD MONITORING:

1. PID: _____ Background (clean zone)

   _____ Probe used/Model used

   _____ Reading from container opening

2. FID: _____ Background (clean zone)

   _____ Reading from container opening

3. Radiation Meter:

   _____ Model used

   _____ Background (clean zone)

   _____ Reading from container opening

4. Explosimeter/Oxygen Meter:

   _____ Oxygen level from container opening

   _____ LEL level from container opening

APPENDIX A (Cont'd)

Attachments

ATTACHMENT 2. Field Test Data Sheet for Drum/Tank Sampling

Samplers: _____ Date: _____

Site Name: _____ Work Order Number: 3347-040-001-_____

Container Number/Sample Number: _____ REAC Task Leader: _____

SAMPLE MONITORING INFORMATION:

1. PID: _____ Background (clean zone)

_____ Probe used/Model used

_____ Reading from sample

2. FID: _____ Background (clean zone)

_____ Reading from sample

3. Radiation Meter: _____ Model used

_____ Background (clean zone)

_____ Reading from sample

4. Explosimeter/Oxygen Meter: _____ Oxygen level (sample)

_____ LEL level (sample)

SAMPLE DESCRIPTION:

_____ Liquid _____ Solid _____ Sludge _____ Color _____ Vapors

WATER REACTIVITY:

1. Add small amount of sample to water: _____ bubbles _____ color change to _____

_____ vapor formation _____ heat _____ No Change

SPECIFIC GRAVITY TEST (compared to water):

1. Add small amount of sample to water: _____ sinks _____ floats

2. If liquid sample sinks, screen for chlorinated compounds. If liquid sample floats and appears to be oily, screen for PCBs (Chlor-N-Oil kit).

APPENDIX A (Cont'd)

Attachments

ATTACHMENT 2. Field Test Data Sheet for Drum/Tank Sampling (cont'd)

CHLOR N OIL TEST KIT INFORMATION:

1. Test kit used for this sample: Yes No

2. Results: _____ PCB not present _____ PCB present, less than 50 ppm

_____ PCB present, greater than 50 ppm _____ 100% PCB present

WATER SOLUBILITY TEST:

1. Add approximately one part sample to five parts water. You may need to stir and heat gently. **[DO NOT HEAT IF WATER REACTIVE!]** Results: _____ total _____ partial _____ no solubility

pH OF AQUEOUS SOLUTION:

1. Using 0-14 pH paper, check pH of water/sample solution: _____.

SPILL-FYTER CHEMICAL CLASSIFIER STRIPS:

1. Acid/Base Risk: (Circle one)	Color Change
Strong acid (0)	RED
Moderately acidic (1-3)	ORANGE
Weak acid (5)	YELLOW
Neutral (7)	GREEN
Moderately basic (9-11)	Dark GREEN
Strong Base (13-14)	Dark BLUE

2. Oxidizer Risk: (Circle one)

Not Present	WHITE
Present	BLUE, RED, OR ANY DIVERGENCE FROM WHITE

3. Fluoride Risk: (Circle one)

Not Present	PINK
Present	YELLOW

APPENDIX A (Cont'd)

Attachments

ATTACHMENT 2. Field Test Data Sheet for Drum/Tank Sampling (cont'd)

4. Petroleum Product, Organic Solvent Risk: (Circle one)

Not Present	LIGHT BLUE
Present	DARK BLUE

5. Iodine, Bromine, Chlorine Risk: (Circle one)

Not Present	PEACH
Present	WHITE OR YELLOW

SETAFLASH IGNITABILITY TEST:

140°F	Ignitable: _____	Non-Ignitable _____
160°F	Ignitable: _____	Non-Ignitable _____
_____	Ignitable: _____	Non-Ignitable _____
_____	Ignitable: _____	Non-Ignitable _____
_____	Ignitable: _____	Non-Ignitable _____
_____	Ignitable: _____	Non-Ignitable _____

Comments:
_____
_____
_____
_____
_____
_____

HAZCAT KIT TESTS:

1. Test: _____ Outcome:_____

Comments:_____

_____

2. Test: _____ Outcome:_____

Comments:_____

_____

APPENDIX A (Cont'd)

Attachments

ATTACHMENT 2. Field Test Data Sheet for Drum/Tank Sampling (cont'd)

3. Test: _____ Outcome:_____

Comments:_____

_____

4. Test: _____ Outcome:_____

Comments:_____

_____

5. Test: _____ Outcome:_____

Comments:_____

_____

HAZCAT PESTICIDES KIT:

Present: _____ Not Present: _____

Comments: _____

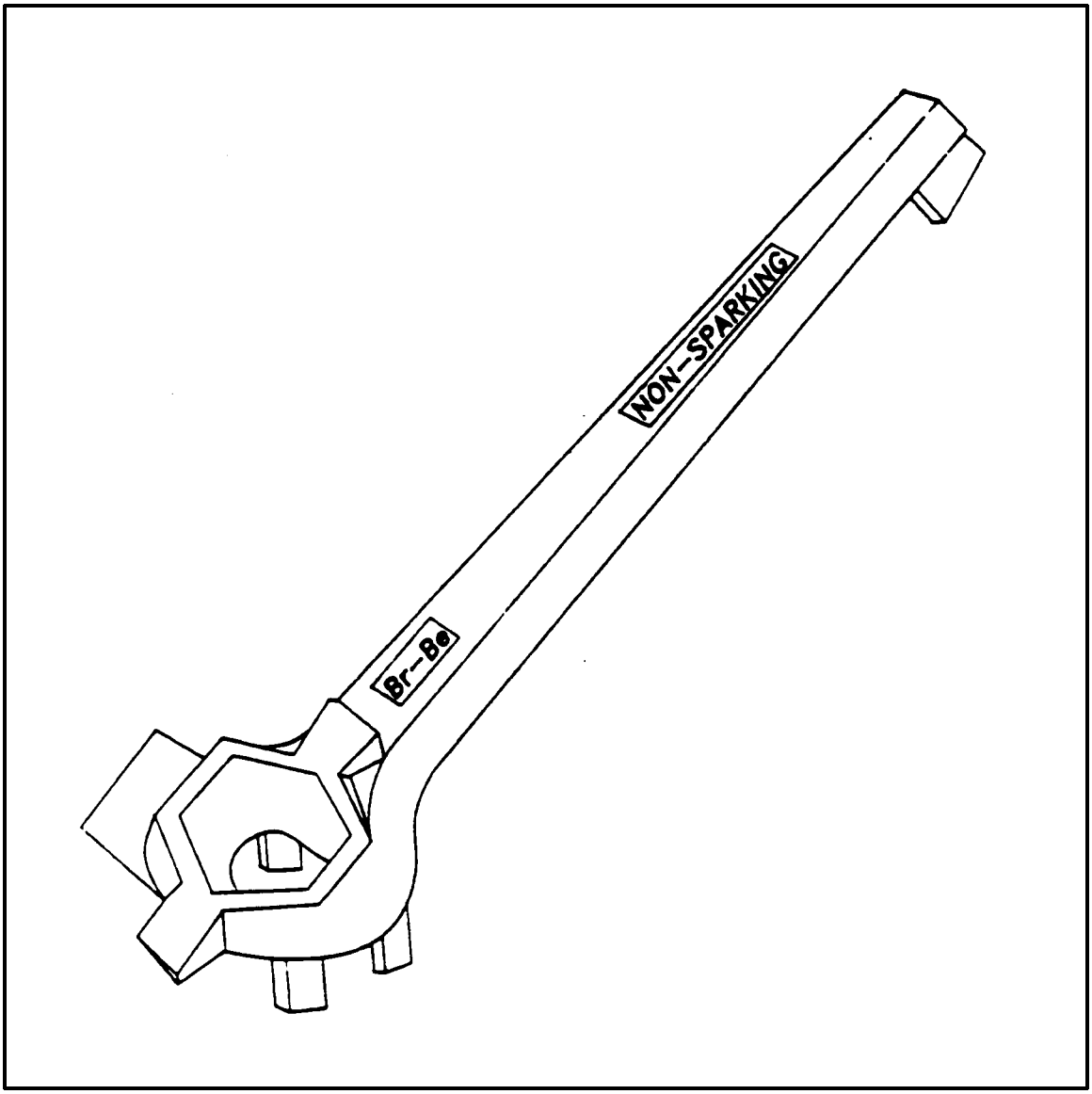
_____

_____

APPENDIX B

Figures

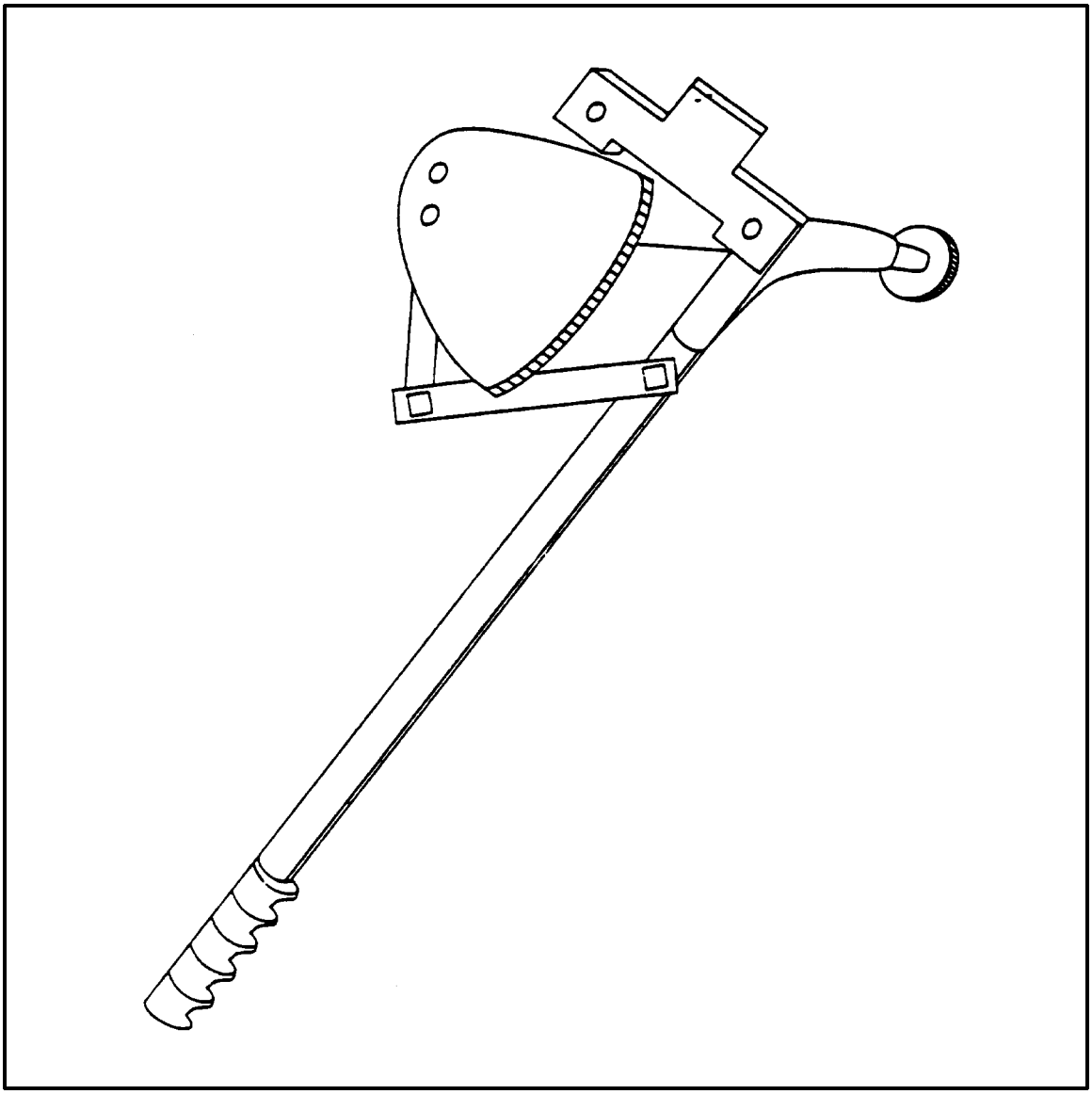
Figure 1. Universal Bung Wrench



APPENDIX B (Cont'd)

Figures

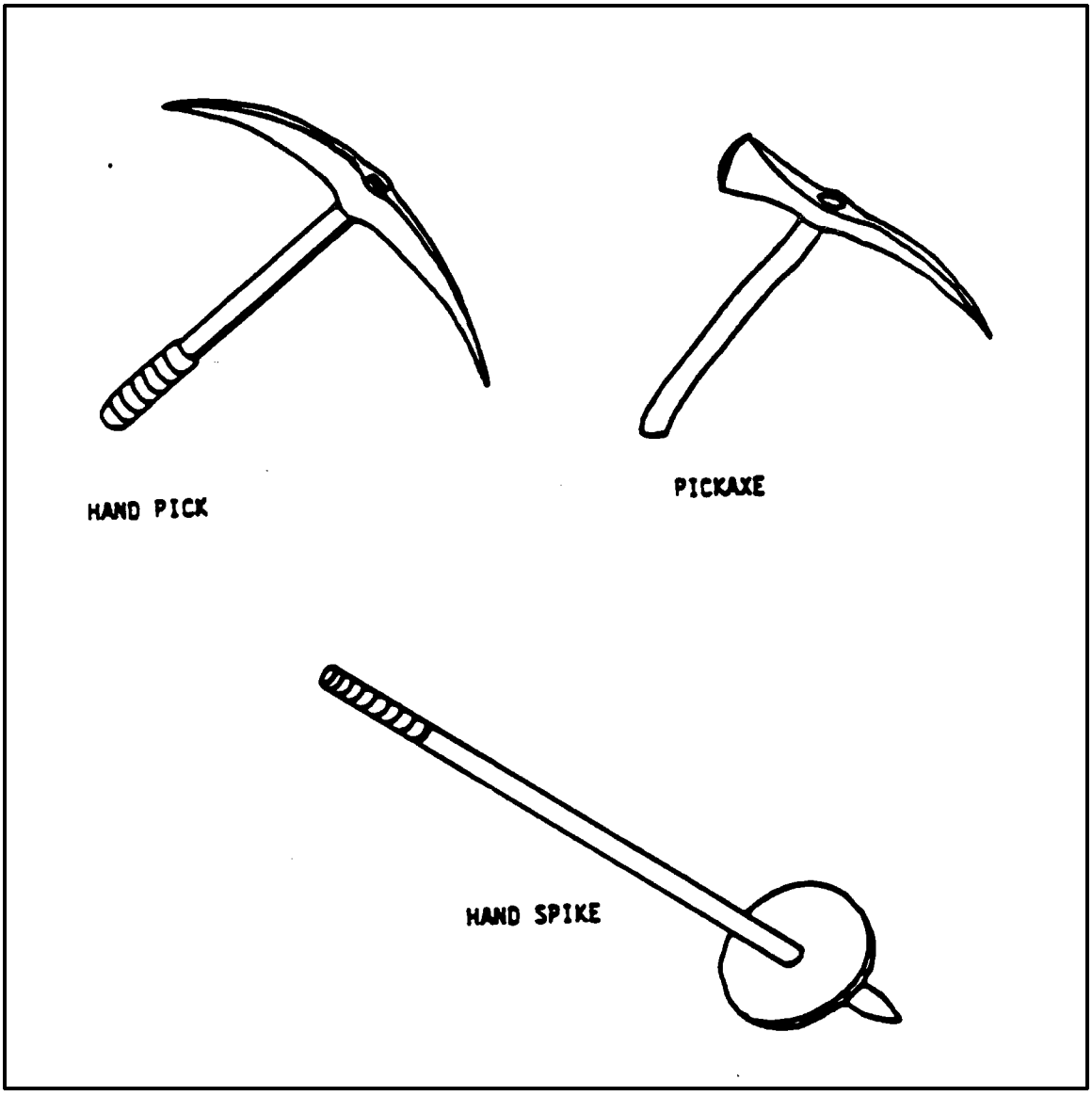
Figure 2. Drum Deheader



APPENDIX B (Cont'd)

Figures

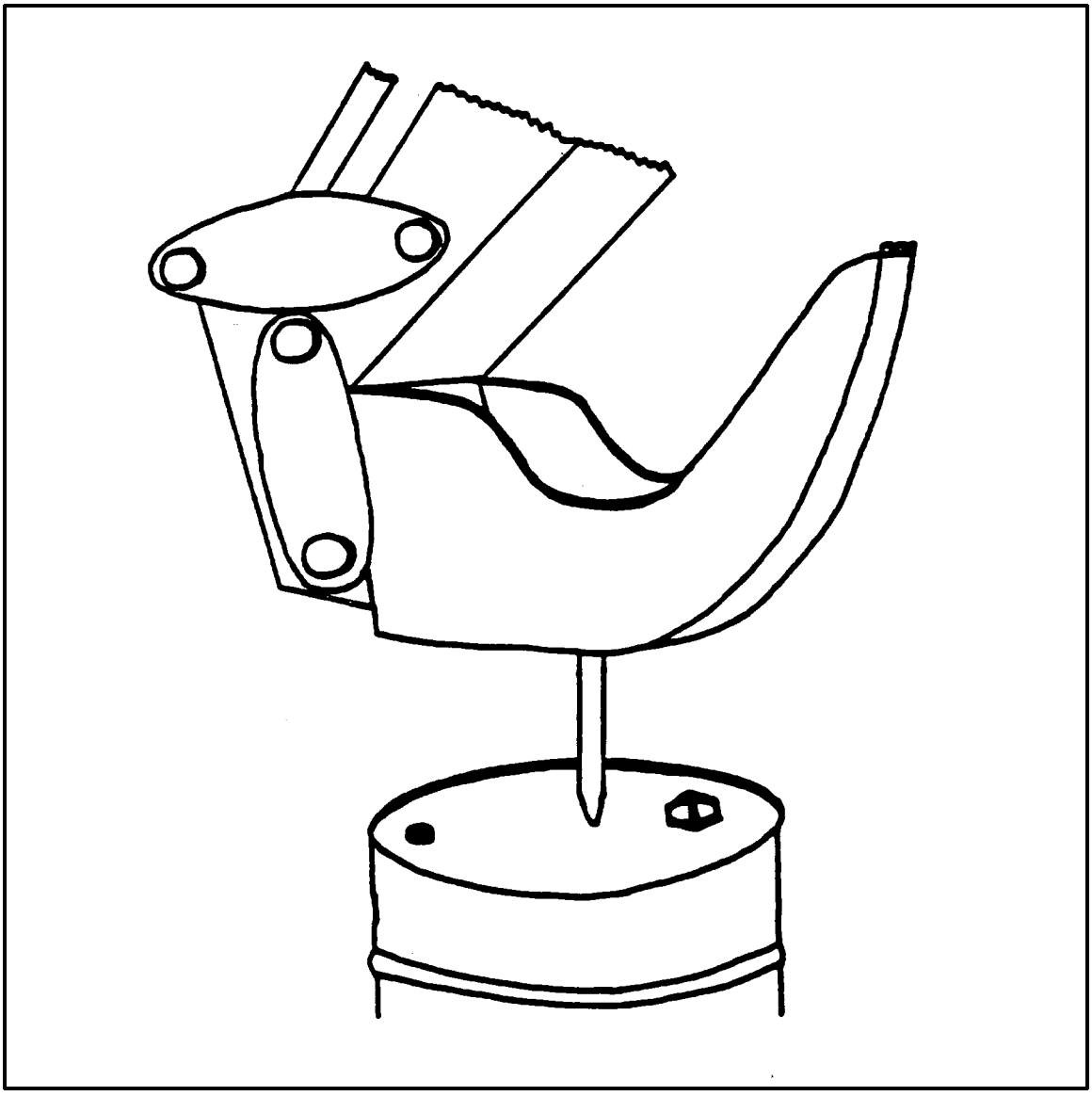
Figure 3. Hand Pick, Pickaxe, and Hand Spike



APPENDIX B (Cont'd)

Figures

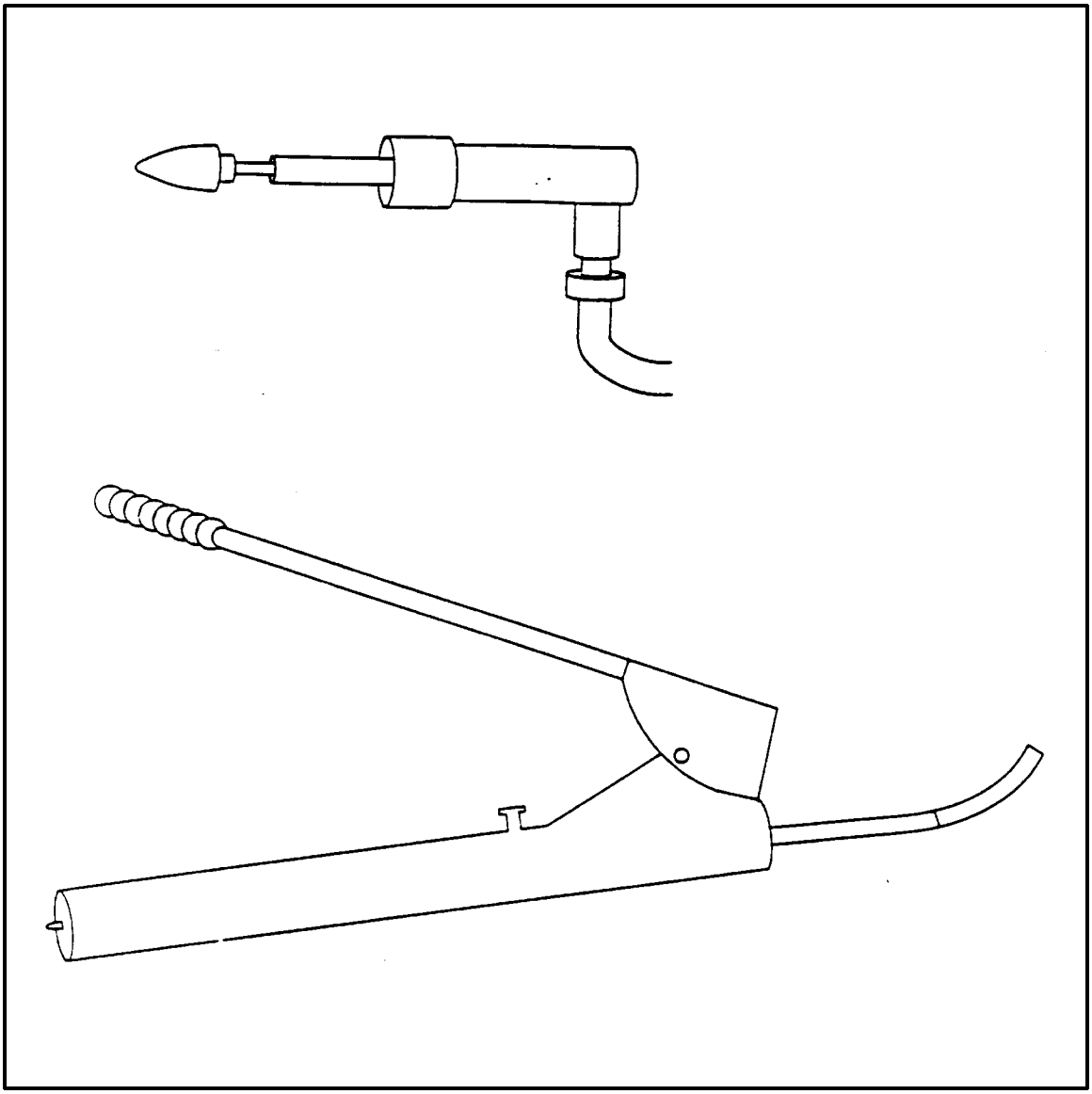
Figure 4. Backhoe Spike



APPENDIX B (Cont'd)

Figures

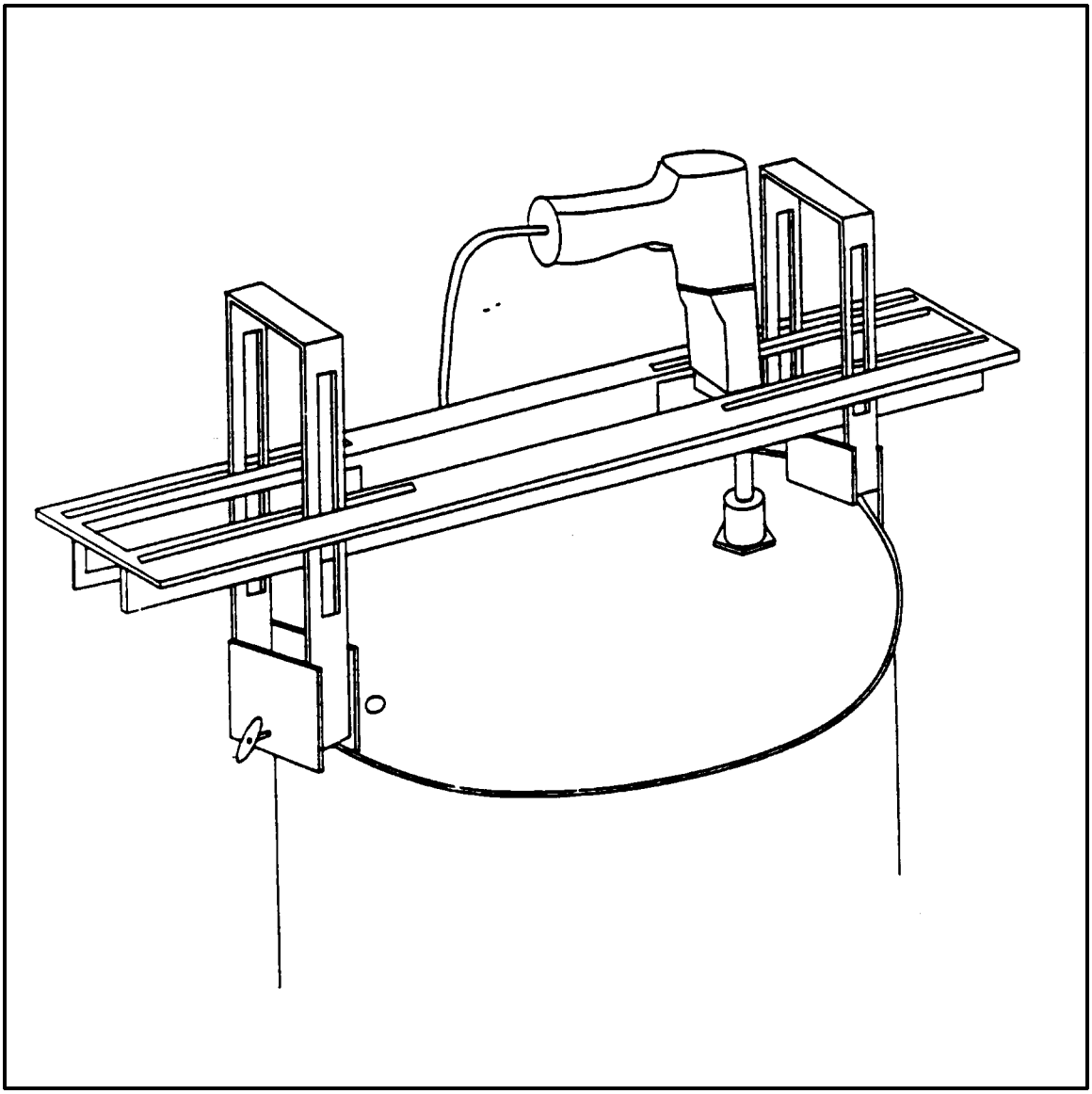
Figure 5. Hydraulic Drum Opener



APPENDIX B (Cont'd)

Figures

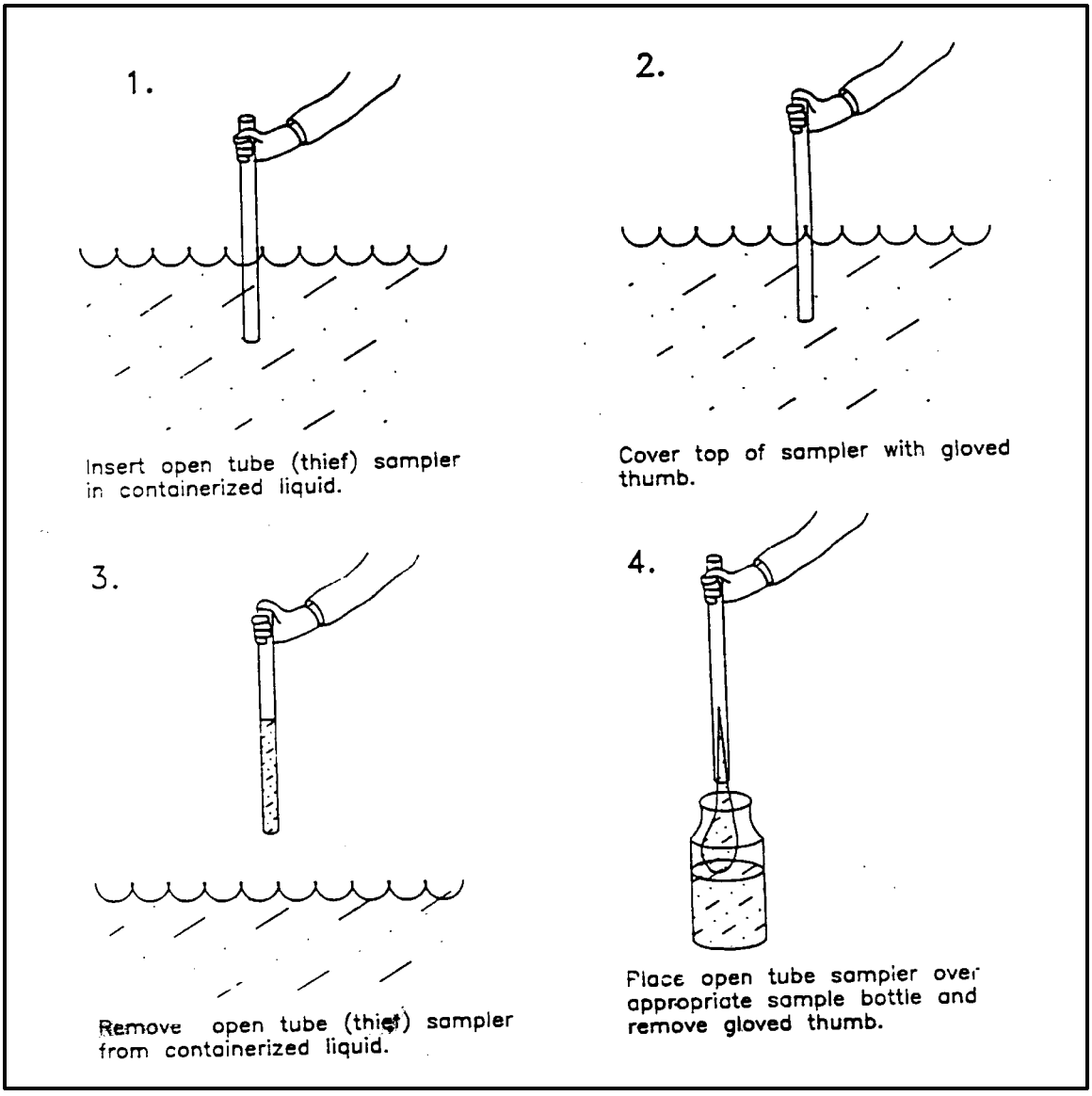
Figure 6. Pneumatic Bung Remover



APPENDIX B (Cont'd)

Figures

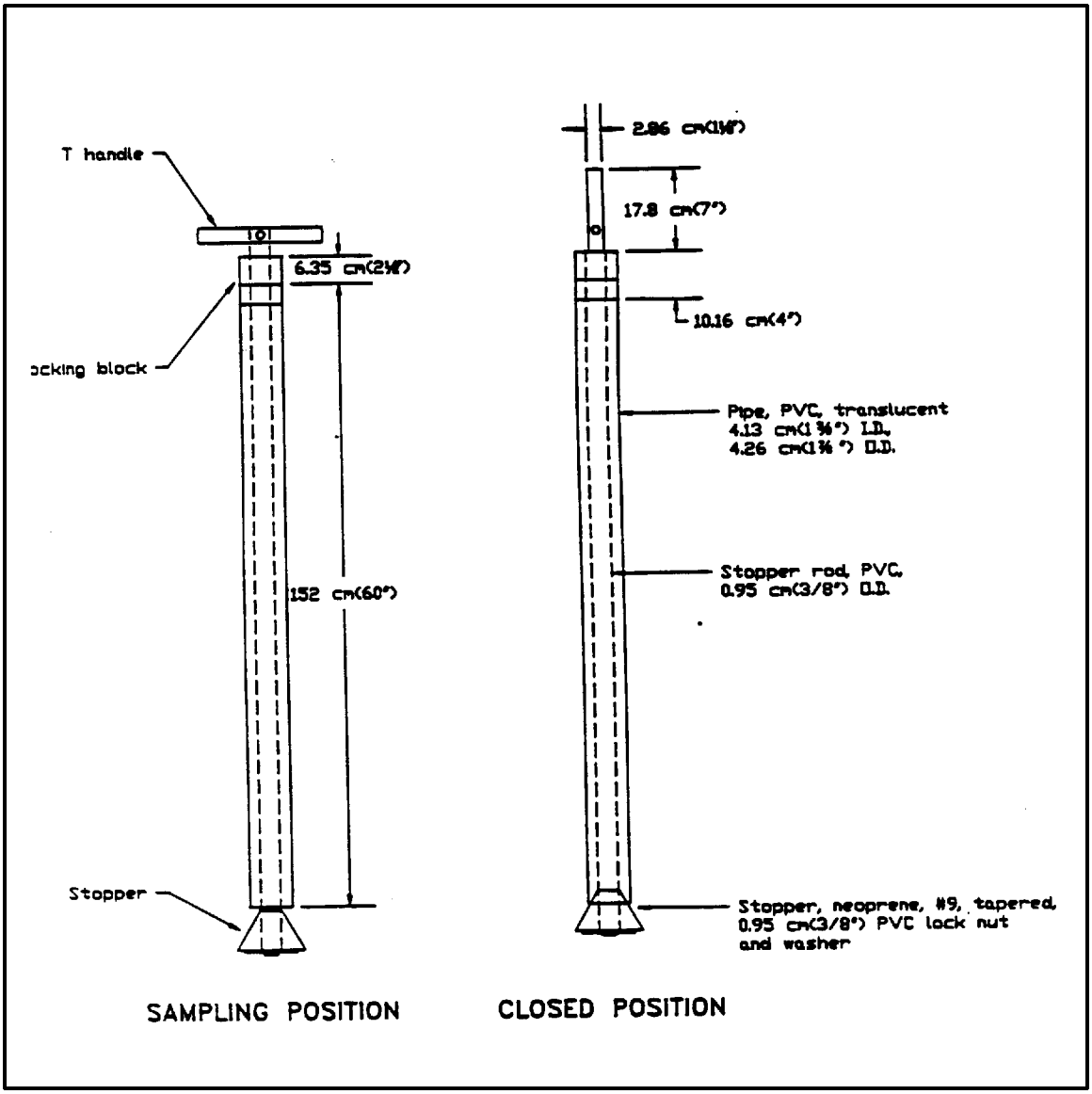
Figure 7. Glass Thief



APPENDIX B (Cont'd)

Figures

Figure 8. COLIWASA



Appendix E

EPA ERT SOP 2002 Sample Documentation

U. S. EPA ENVIRONMENTAL RESPONSE TEAM

STANDARD OPERATING PROCEDURES

SAMPLE DOCUMENTATION

CONTENTS

* These sections affected by Revision 0.0.

SUPERCEDES: SOP #2002; Revision 2.0; 05/17/93; U.S. EPA Contract 68-03-3482.

SAMPLE DOCUMENTATION

1.0 OBJECTIVE

The objective of this Standard Operating Procedure (SOP) is to define the procedures for preparing and maintaining documentation which provides the details of field sampling activities. The sample documentation discussed in this procedure includes: site and personal logbooks, Field Data Sheets and labels, and Chain of Custody records and Custody seals.

2.0 APPLICABILITY

This SOP is applicable to all REAC field activities which involve the generation of environmental measurements.

3.0 DESCRIPTION

3.1 General

Accurate sample documentation is essential for proper site evaluation. A clear traceable paper trail must follow each sample from its point of origin to the Final Report (or other appropriate report). It is important that specific procedures be adopted so that the desired degree of accuracy is achieved.

All sample documents must be completed legibly and in ink. Any corrections or revisions must be made by lining through the incorrect entry and initialing the error.

3.2 Site Logbook

The site logbook is used to record data and observations so that an accurate account of field operations can be reconstructed in the writer's absence. There is the potential, especially on Superfund sites, for site logs to be used as legal evidence sometime in the future. The site logbook is essentially a descriptive notebook detailing site activities and observations. All entries should be dated and signed by the individual(s) making the entries. Site logbooks should contain at a minimum, the following information:

- Site name and location on inside cover
- Date and location of field work
- Times (military times preferred, or reference a.m. or p.m.)
- Names and addresses of field contacts
- Site sketches and photographic references
- Weather conditions (Optional if provided on Field Data Sheets. See Section 3.1.)
- Sample descriptions, locations, times taken, identification numbers (Optional if provided on Field Data Sheets. See Section 3.4.1.)
- Chain of Custody information, shipping paper identification number, recipient address, and phone number, etc.

- Field observations and discussion (Optional if provided on Field Data Sheets. See Section 3.4.1.)
- Field measurements (i.e., pH, temperature, surface water flow rates, etc.) (Optional if provided on Field Data Sheets. See Section 3.4.1.)
- Instructions issued by the Work Assignment Manager
- Field activities by all REAC personnel on site

Entries may be made in site logbooks by any ERT or REAC personnel on site and should detail the activities of all personnel involved in the field operations. Each entry should be signed by the person making the entry and should relate to previous entries or have sufficient background detail. The sequence of site activities should be clear to a reader who was not at the site.

When a site logbook is completed, no longer needed for site documentation, or after a project is finished, the site logbook must be transmitted to the appropriate Work Assignment folder of the Central File. If the site logbook is transmitted to the ERT, documentation of the transmittal must be prepared and maintained in the Central File.

3.3 Personal Logbooks

When involved in field operations, all REAC personnel will maintain a personal logbook. The personal logbook will be a chronological compilation of the individual's daily field activities. Personal logbooks are to be maintained, even if a REAC member is entering information in a site log. The personal logbook may reference the site logbook, but must also identify what, if any, work was performed when not on site. In the absence of a dedicated site logbook, the personal logbook must detail all site related activities that would typically be entered in a site logbook.

If personal logbooks are used for site-related information in lieu of a dedicated site logbook, the REAC Task Leader must obtain copies of the site notes from each individual field member and transmit the notes under a standard cover memo (Figure 1, Appendix A) to the Central File. This must be done within 10 working days of completion of field activities.

Personal logbooks may be maintained for the individual's daily office activities at the discretion of the individual. When a REAC member is in the office, the personal logbook should contain, at a minimum, meetings attended and meeting notes, telephone conversations, and detail of any work performed that relates to a particular site. Any task related entries should include the Work Assignment number. Entries should include, but are not limited to, the following:

- Field and project-related activities performed
- Directives from Work Assignment Manager
- Verbal instructions from U.S. EPA personnel
- Personal injuries or potential exposures
- Phone conversations relevant to Work Assignments

When a personal logbook is completed or the person to whom it is assigned leaves REAC, the personal logbook shall be returned to the Quality Assurance (QA) Office. People who must access information in a personal logbook may obtain photocopies from the person to whom the logbook is assigned.

3.4 Field Data Sheets and Sample Labels

Field Data Sheets and corresponding sample labels are used to identify samples and document field sampling conditions and activities. There are several different Field Data Sheets and sample labels used within the REAC project.

Field Data Sheets will be maintained by the Task Leader or designee. Task Leaders are responsible for conveying original Field Data Sheets to the corresponding Central File folder upon completion of the Trip or Final Report. Field Data Sheets may be transmitted to the Central File as an attachment to these reports or as a stand alone document.

3.4.1 Field Data Sheets and Sample Labels

Prenumbered Field Data Sheets and corresponding, prenumbered sample labels (Figures 2 and 3, Appendix A) are used for all types of samples except soil gas and air samples (see Sections 3.4.2 and 3.4.3).

Upon sample collection at a particular sampling location, Field Data Sheet(s) shall be completed with the following information:

1. Site name, sampling location, date and time of sampling, name(s) of sampler(s), Chain of Custody record number, REAC Task Leader's name, U.S. EPA Work Assignment Manager's name, and the Work Assignment number.

2. Site description and, as applicable, soil type, surface water, stream, and bottom information.

3. Sample type, sampling device, sample information (e.g., color, odor, temperature, pH, etc.) and weather parameters.

4. Analyses to be performed and sample preparation information.

Also upon sample collection, the corresponding prenumbered sample labels must be completed and securely affixed to the sample container(s).

Because samples are often collected from the same location in more than one container (for more than one analysis), the sample label consists of several parts (Figure 3, Appendix A). The largest part of the sample label consists of the project name and U.S. EPA contract number, the unique sample identification number consisting of the prefix "A" followed by a five-digit number (A01001), and spaces for inserting the following information: site name,

work order number, date and time of collection, the analysis requested, and the preservative. Other parts of the sample label include additional sample labels numbered with the same sample identification number and consecutive letter prefixes (B01001 to L01001).

When a sample is collected in only one container, the largest part of the sample label is completed and affixed to the sample container. When the sample is collected in multiple containers, the largest part of the sample label is completed and affixed to one of the sample containers, and the additional labels, beginning with letter prefix "B," are affixed to the additional containers in a consecutive order. If more than 12 containers are included in a sample set, then the sampler may use blank labels and insert the sample identification number beginning with letter prefix "M" (M01001).

If duplicates or blanks are collected at a sampling location, the sample sets must be treated as being unique from the original sample and labeled with different sample identification numbers. When collecting samples for parameters which require extra volume for matrix spike/matrix spike duplicate (MS/MSD) analysis, the original sample container(s) and the MS/MSD containers are labeled with the same sample identification number and consecutive letter prefixes. For example, a water sample for BNA analysis that also requires MS/MSD analysis would be collected in four sample containers which would be labeled A01003 through D01003. Required volumes for MS/MSD analysis for typical parameters are specified in ERT/REAC SOP #4005, Chain of Custody.

3.4.2 Soil Gas Sampling Data Sheets and Sample Labels

Soil Gas Sampling Data Sheets and prenumbered sample labels (Figure 4 and 5, Appendix A) are used for all soil gas sampling activities.

The heading of the data sheets shall be completed with the following information: site name, samplers, date, REAC Task Leader, U.S. EPA Work Assignment Manager, the project number, and the weather parameters.

After the soil gas well is screened with field instrument(s), the location identification, pertinent remarks, time, depth, and the instrument reading(s) are recorded in the first available column on the Soil Gas Sampling Data Sheet. A total of five (5) columns are available to record data from five sampling points on each Data Sheet.

If a soil gas sample was collected at that particular location, "Y" is circled to indicate this. The soil gas sample label is completed with the site name, sample location, date, time, remarks, and instrument readings; then the label is affixed to the sample container. A corresponding sample label (with sample identification number only) is inserted on the sample number line in the appropriate column on the soil gas sampling data sheet. If a soil gas sample was not collected at that particular location, "N" is circled to indicate this.

If necessary, the additional sample label (with the sample identification number only) can be inserted in the logbook used for documenting sampling activities, or it can be used for

additional sample containers if the sample is collected in multiple containers. Blank sample labels are also provided so that sample numbers can be written in, when needed. Trip standards, field blanks, and samples containing spikes must be assigned unique sample identification numbers. Soil Gas Sampling Data Sheets and sample labels will be prepared and maintained for these types of samples in the same manner as other sample matrices.

3.4.3 Air Sampling Work Sheets and Sample Labels

Air Sampling Work Sheets and prenumbered sample labels (Figures 6 and 7, Appendix A, respectively) are used for all air sampling activities.

The heading of the Air Sampling Worksheet is completed with the following information: site name, samplers, date, Work Assignment number, the name of the U.S. EPA Work Assignment Manager, and the REAC Task Leader.

When air sampling is initiated, the following information is recorded in the first available column on the Air Sampling Worksheet: sample number, location, pump number media, analysis/method and time/counter start. At the end of the sampling period the following information is recorded: time/counter stop, total time, pumpfault (indicate by using "Y" or "N"), flow rate start, flow rate stop, flow rate average, and volume, are recorded. A total of five columns are available to record data from five sampling locations on each air sampling worksheet.

The total sampling time is calculated by subtracting the start time/counter value from the stop time/counter value. The flow rate average is calculated from the start and stop flow rates. The volume sampled is calculated by multiplying the total sampling time by the average flow rate. All calculated values, along with the analysis requested, are recorded in the appropriate location on the air sampling worksheets.

If real-time air monitoring instruments are used at a particular sample location, the instrument readings are recorded on an Air Monitoring Work Sheet (Figure 8, Appendix A). If air samples are collected outdoors, then the appropriate weather parameters are also recorded on the Air Monitoring Work Sheet.

The prenumbered air sample label (Figure 7, Appendix A) consists of several parts. The largest part includes the project name, the contract number, the sample identification number, and space for the following information: the site name, volume of air, date, time, requested analysis, and remarks. Other parts include two additional sample labels with only the sample identification number.

When a sample is collected, the largest part of the sample label is completed and affixed to the sample container in the manner described by the appropriate ERT/REAC air sampling SOP. If samples are collected from a single sampling location in more than one sample media, separate sample numbers are used for each different sample medium used. The blank space at the end of the sample identification number is used to indicate the media. The small

sample labels are affixed to the additional sample containers. If available, the small sample labels may be inserted in the sample number space in the appropriate column on the Air Sampling Work Sheet. Blank sample labels are provided for use as necessary.

Alternatively, at the Task Leader's discretion, separate sample numbers may be used for each media in which samples are collected at a single sampling location. In this case, the largest part of the sample label will be completed and affixed to the sample container in the manner described by the appropriate ERT/REAC air sampling SOP. The small sample labels (with sample identification number only) will be affixed to the Air Sampling Worksheet and the logbook.

Quality Control (QC) samples must be assigned unique sample identification numbers. Air Sampling Work Sheets and prenumbered sample labels will be prepared and maintained in the same manner as for other sample matrices.

3.4.4 Specialized Field Data Sheets

Task Leaders, with the approval of the Group Leader, the Work Assignment Manager, and the QA Officer, may develop specialized Field Data Sheets if none of the three types described above meet the specific needs of the project. At a minimum, the Field Data Sheet must include space for recording the name(s) of the sampler(s), the sample number(s), the location of the sample, the date and time that the sample was taken, and any pertinent field conditions. The following information will be included in the header of the data sheet: (Matrix) Data Sheet, Roy F. Weston, Inc., REAC, Edison, NJ, U.S. EPA Contract: 68-C4-0022.

3.5 Chain of Custody

A Chain of Custody record (Figure 9, Appendix A) must be maintained from the time a sample is collected to its final deposition. The Chain of Custody record shall contain, at a minimum, the following information: project name, project number, the REAC contact, and the contact telephone number. For each sample collected, the Chain of Custody record shall include the sample number, sampling location, sample matrix, date collected, number of bottles, container/preservative, the analysis requested, and special instructions, if any are applicable.

Chain of Custody records must be completed legibly, with all required information, so that miscommunication with, or misunderstanding by, the receiving laboratory is prevented.

If samples collected during a sampling event are being forwarded to more than one laboratory, then a separate Chain of Custody record, indicating which samples are being sent to that particular laboratory, must be completed.

The Chain of Custody provides a means by which the entire path and life of a sample can be traced. Every transfer of custody must be noted and signed for on the Chain of Custody record. If a sample or group of samples is not under direct control or observation of the individual responsible for the

samples, then they must be stored in a locked container that has been sealed with a Custody Seal (Section 3.6). A copy of the Chain of Custody record should be kept by each individual who has signed it. The final copy should be included with the Analytical Report.

3.6 Custody Seals

Custody Seals (Figure 10, Appendix A) demonstrate that a sample container has not been opened or tampered with during transport or storage. Two seals should be affixed in such a manner that the shipping container cannot be opened without breaking the seal. The person in direct possession of the samples shall sign and date the seal. The name of the individual signing the seal and a description of the packaging shall be noted in the site logbook.

4.0 RESPONSIBILITIES

4.1 Task Leaders and Field Staff

Task Leaders and field staff are responsible for preparing and maintaining sample documentation in accordance with this SOP.

4.2 Group Leaders and Section Leaders

Group Leaders and Section Leaders are responsible for ensuring implementation of the procedures outlined in this SOP.

4.3 QA Office

The QA Office is responsible for ensuring compliance with this SOP by auditing reports prepared by REAC personnel.

APPENDIX A
Figures
SOP #2002
September 1994

FIGURE 1. Cover Memo - Transmittal of Site Notes

DATE:

TO: Central File # _____

FROM: _____, Task Leader

SUBJECT: LOGBOOK NOTES
SITE NAME, DATE(s)

Attached please find copies of field-related personal logbook records for activities performed at the above- referenced site. Individuals involved included:

NAME	LOGBOOK NUMBER

w/Attachments

FIGURE 2. Field Data Sheet

FIELD DATA SHEET 26880

Roy F. Weston, Inc.
REAC, Edison, N.J.
EPA Contract 68-C4-0022

Chain of Custody No. _____
Samplers: _____ REAC Task Leader: _____
Date: _____ Site Name: _____ EPA WAM _____
Time: _____ Sample Location: _____ Work Assignment No.: _____

SITE DESCRIPTION			SOIL TYPE		SURFACE WATER	STREAM	BOTTOM	
landfill	old field	upland palustrine	rock	clay	color _____	width _____	rock	silt
industrial	wooded	lowland riverine	gravel	muck	odor _____	depth _____	rubble	clay
commercial	farmland	lacustrine	sand	loam	flow _____	velocity _____ cm/s	gravel	organic
residential	gully		silt	peat	direction _____	pools _____ %	shell	other _____
hedgegrows	floodplain		color _____			riffles _____ %	sand	

SAMPLE TYPE		DEVICE		SAMPLE INFORMATION		WEATHER PARAMETERS
surface water	effluent	kemmerer	ponar	color _____	pH _____	ambient temp _____
groundwater	sludge	trowel	other _____	odor _____	ORP _____	barometric pressure _____
potable water	leachate	bucket		temp _____	salinity _____	relative humidity _____
sediment	waste	auger		DO _____	sample depth _____	weather conditions _____
soil	other _____	ekman		cond _____	tide stage _____	_____

ANALYSES TO BE PERFORMED

ORGANICS
- A. halogenated & aromatic volatiles
- B. volatiles
- C. trihalomethanes
- D. pesticides/PCB
- E. PCB
- F. base neutral/acid extractables
- G. pesticides, drinking water
- H. herbicides, drinking water
- I. other _____

INORGANICS
- A. metals, priority pollutant
- B. metals, TAL
- C. metals scan (ICP)
- D. metals, other _____

RCRA
- A. TCLP
- B. Ignitability
- C. corrosivity _____ pH _____
- D. reactivity
- E. other _____

ORGANICS
- A. total cyanide
- B. total phenol
- C. petroleum hydrocarbons
- D. pH
- E. alkalinity
- F. hardness
- G. total dissolved solids
- H. total suspended solids
- I. sulfate
- J. TOC
- K. grain size
- L. other _____
- M. other _____

SAMPLE PREPARATION

CONTAINER	PRESERVATIVES
glass jar	HNO_3
plastic jar	NaOH
acetate core	Zn Acetate
plastic bag	HCl
plastic bucket	Na_2SO_4
other _____	other _____

STORAGE
wet ice
dry ice
ambient

COMMENTS:

FIGURE 3. Sample Labels

ROY F. WESTON, INC. REAC, EDISON, NJ EPA Contract 68-C4-0022	SAMPLE NO. A 26880
SITE NAME:	DATE:
WORK ORDER NO:	TIME:
ANALYSIS REQUESTED:	
PRESERVATIVE: ☐ NONE ☐ SULFURIC ACID ☐ OTHER (Specify:) ☐ COOL (4°C) ☐ SODIUM HYDROXIDE ☐ NITRIC ACID ☐ SODIUM THIOSULFATE	

B 26880
C 26880
D 26880
E 26880
F 26880
G 26880
H 26880
I 26880
J 26880
K 26880
L 26880

FIGURE 4. Soil Gas Sampling Data Sheet

SOIL GAS SAMPLING SHEET

Roy F. Weston, Inc.
REAC Project, Edison, NJ
EPA Contract No. 68-C4-0022

Site Name: _____ REAC Task Leader: _____

Samplers: _____ EPA Work Assignment Manager: _____

Date: _____ Work Assignment No.: _____

Weather Parameters: ambient temp. _____ relative humidity _____
barometric pressure _____ weather conditions _____

Sample No.:					
Location ID.:					
Remarks:					
Time:					
Sample Depth:					
Sample Taken:	Y/N	Y/N	Y/N	Y/N	Y/N
Instrument Readings:					
HNU					
OVA					
LEL					
% O_2					
Soil Temp.					
Other					

General Comments:

FIGURE 5. Soil Gas Sample Labels

Roy F. Weston, Inc.
REAC, EDISON, NJ SAMPLE NO. SG 02951
EPA CONTRACT 68-C4- 22
SITE NAME: | DATE: TIME:
SAMPLE LOCATION: | REMARKS:
HNu _____ % O_2 _____
OVA _____ SOIL TEMP. _____
LEL _____ OTHER _____

Roy F. Weston, Inc.
REAC, EDISON, NJ SAMPLE NO. SG 02952
EPA CONTRACT 68-C4- 22
SITE NAME: | DATE: TIME:
SAMPLE LOCATION: | REMARKS:
HNu _____ % O_2 _____
OVA _____ SOIL TEMP. _____
LEL _____ OTHER _____

SG 02951
SG 02951
SG 02952
SG 02952
SG 0

Roy F. Weston, Inc.
REAC, EDISON, NJ SAMPLE NO. SG 02953
EPA CONTRACT 68-C4-0022
SITE NAME: | DATE: TIME:
SAMPLE LOCATION: | REMARKS:
HNu _____ % O_2 _____
OVA _____ SOIL TEMP. _____
LEL _____ OTHER _____

Roy F. Weston, Inc.
REAC, EDISON, NJ SAMPLE NO. SG 02954
EPA CONTRACT 68-C4-0022
SITE NAME: | DATE: TIME:
SAMPLE LOCATION: | REMARKS:
HNu _____ % O_2 _____
OVA _____ SOIL TEMP. _____
LEL _____ OTHER _____

SG 02953
SG 02953
SG 02954
SG 02954
SG 0

Roy F. Weston, Inc.
REAC, EDISON, NJ SAMPLE NO. SG 02955
EPA CONTRACT 68-C4- 22
SITE NAME: | DATE: TIME:
SAMPLE LOCATION: | REMARKS:
HNu _____ % O_2 _____
OVA _____ SOIL TEMP. _____
LEL _____ OTHER _____

Roy F. Weston, Inc.
REAC, EDISON, NJ SAMPLE NO. SG 02956
EPA CONTRACT 68-C4- 22
SITE NAME: | DATE: TIME:
SAMPLE LOCATION: | REMARKS:
HNu _____ % O_2 _____
OVA _____ SOIL TEMP. _____
LEL _____ OTHER _____

SG 02955
SG 02955
SG 02956
SG 02956
SG 0

Roy F. Weston, Inc.
REAC, EDISON, NJ SAMPLE NO. SG 02957
EPA CONTRACT 68-C4- 22
SITE NAME: | DATE: TIME:
SAMPLE LOCATION: | REMARKS:
HNu _____ % O_2 _____
OVA _____ SOIL TEMP. _____
LEL _____ OTHER _____

Roy F. Weston, Inc.
REAC, EDISON, NJ SAMPLE NO. SG 02958
EPA CONTRACT 68-C4- 22
SITE NAME: | DATE: TIME:
SAMPLE LOCATION: | REMARKS:
HNu _____ % O_2 _____
OVA _____ SOIL TEMP. _____
LEL _____ OTHER _____

SG 02957
SG 02957
SG 02958
SG 02958
SG 0

Roy F. Weston, Inc.
REAC, EDISON, NJ SAMPLE NO. SG 02959
EPA CONTRACT 68-C4- 22
SITE NAME: | DATE: TIME:
SAMPLE LOCATION: | REMARKS:
HNu _____ % O_2 _____
OVA _____ SOIL TEMP. _____
LEL _____ OTHER _____

Roy F. Weston, Inc.
REAC, EDISON, NJ SAMPLE NO. SG 02960
EPA CONTRACT 68-C4- 22
SITE NAME: | DATE: TIME:
SAMPLE LOCATION: | REMARKS:
HNu _____ % O_2 _____
OVA _____ SOIL TEMP. _____
LEL _____ OTHER _____

SG 02959
SG 02959
SG 02960
SG 02960
SG 0

FIGURE 6. Air Sampling Work Sheet

ENVIRONMENTAL RESPONSE TEAM
AIR SAMPLING WORK SHEET

Page ___ of ___

Roy F. Weston, Inc.
REAC Project, Edison, NJ
EPA Contract No. 68-C4-0022

Site: _____ WA#: _____

Samplers: _____ EPA/ERT WAM: _____

Date: _____ REAC Task Leader:: _____

Sample #					
Location					
Pump #					
Media					
Analysis/Method					
Time/Counter (Start)					
Time/Counter (Stop)					
Total Time					
Pump Fault	Y / N	Y / N	Y / N	Y / N	Y / N
Flow Rate (Start)					
Flow Rate (Stop)					
Flow Rate (Average)					
Volume					

MET Station On-site? Y / N

General Comments:

FIGURE 7. Air Sample Labels

Roy F. Weston, Inc. REAC, EDISON, NJ SAMPLE NO. 07091_ EPA CONTRACT 68-C4- 22 SITE NAME: DATE: VOL. OF AIR: TIME: ANALYSIS REQUEST: REMARKS:	**Roy F. Weston, Inc.** REAC, EDISON, NJ SAMPLE NO. 07092_ EPA CONTRACT 68-C4- 22 SITE NAME: DATE: VOL. OF AIR: TIME: ANALYSIS REQUEST: REMARKS:	07091_ 07091_ 07092_ 07092_ 0 _
Roy F. Weston, Inc. REAC, EDISON, NJ SAMPLE NO. 07093_ EPA CONTRACT 68-C4- 22 SITE NAME: DATE: VOL. OF AIR: TIME: ANALYSIS REQUEST: REMARKS:	**Roy F. Weston, Inc.** REAC, EDISON, NJ SAMPLE NO. 07094_ EPA CONTRACT 68-C4- 22 SITE NAME: DATE: VOL. OF AIR: TIME: ANALYSIS REQUEST: REMARKS:	07093_ 07093_ 07094_ 07094_ 0 _
Roy F. Weston, Inc. REAC, EDISON, NJ SAMPLE NO. 07095_ EPA CONTRACT 68-C4- 22 SITE NAME: DATE: VOL. OF AIR: TIME: ANALYSIS REQUEST: REMARKS:	**Roy F. Weston, Inc.** REAC, EDISON, NJ SAMPLE NO. 07096_ EPA CONTRACT 68-C4- 22 SITE NAME: DATE: VOL. OF AIR: TIME: ANALYSIS REQUEST: REMARKS:	07095_ 07095_ 07096_ 07096_ 0 _
Roy F. Weston, Inc. REAC, EDISON, NJ SAMPLE NO. 07097_ EPA CONTRACT 68-C4- 22 SITE NAME: DATE: VOL. OF AIR: TIME: ANALYSIS REQUEST: REMARKS:	**Roy F. Weston, Inc.** REAC, EDISON, NJ SAMPLE NO. 07098_ EPA CONTRACT 68-C4- 22 SITE NAME: DATE: VOL. OF AIR: TIME: ANALYSIS REQUEST: REMARKS:	07097_ 07097_ 07098_ 07098_ 0 _
Roy F. Weston, Inc. REAC, EDISON, NJ SAMPLE NO. 07099_ EPA CONTRACT 68-C4- 22 SITE NAME: DATE: VOL. OF AIR: TIME: ANALYSIS REQUEST: REMARKS:	**Roy F. Weston, Inc.** REAC, EDISON, NJ SAMPLE NO. 07100_ EPA CONTRACT 68-C4- 22 SITE NAME: DATE: VOL. OF AIR: TIME: ANALYSIS REQUEST: REMARKS:	07099_ 07099_ 07100_ 07100_ 0 _

FIGURE 8. Air Monitoring Work Sheet

ENVIRONMENTAL RESPONSE TEAM
AIR SAMPLING WORK SHEET

Page ____ of ____

Roy F. Weston, Inc.
REAC Project, Edison, NJ
EPA Contract No. 68-C4-0022

Site: _____ WA#: _____

Prepared By: _____ EPA/ERT WAM: _____

Date: _____ REAC Task Leader:: _____

Instrument	EPA #	Location/Description	Reading	Time

General Comments:

FIGURE 9. Chain of Custody Record/Lab Work Request

CHAIN OF CUSTODY RECORD / LAB WORK REQUEST No. 10387

Roy F. Weston, Inc.
REAC, Edison, N.J.
EPA Contract 68-C4-0022

Project Name: _____
Project Number: _____
RFW Contact: _____ Phone: _____

Sheet ____ of ____

SAMPLE IDENTIFICATION							ANALYSES REQUESTED			
REAC #	Sample No.	Sampling Location	Matrix	Date Collected	# of Bottles	Container/ Preservative				

Matrix:
SD – Sediment PW – Potable Water S – Soil
DS – Drum Solids GW – Ground Water W – Water
DL – Drum Liquids SW – Surface Water O – Oil
X – Other SL – Sludge A – Air

Special Instructions:

FOR SUBCONTRACT USE ONLY
FROM CHAIN OF
CUSTODY #

Name/Reason	Relinquished By	Date	Received By	Date	Time	Name/Reason	Relinquished By	Date	Received By	Date	Time

FIGURE 10. Custody Seals

WESTON MANAGERS DESIGNERS/CONSULTANTS

CUSTODY SEAL

Date

Signature

WESTON MANAGERS DESIGNERS/CONSULTANTS

CUSTODY SEAL

Date

Signature

Appendix F

EPA ERT SOP 2049 Investigation-Derived Waste Management

U. S. EPA ENVIRONMENTAL RESPONSE TEAM

STANDARD OPERATING PROCEDURES

SOP: 2049
PAGE: 1 of 10
REV: 0.0
DATE: 10/21/94

INVESTIGATION-DERIVED WASTE MANAGEMENT

CONTENTS

SUPERCEDES: SOP #2170; Revision 0.0; 03/22/94; U.S. EPA Contract 68-03-3482.

INVESTIGATION-DERIVED WASTE MANAGEMENT

1.0 SCOPE AND APPLICATION

The objective of this standard operating procedure (SOP) is to provide general reference information on management of investigation-derived wastes (IDW) generated during REAC site investigations. IDW includes soil cuttings, drilling muds, purged groundwater, decontamination fluids (water and other fluids), disposable sampling equipment, and disposable personal protective equipment (PPE).

This SOP is applicable only if the U.S. Environmental Protection Agency (U.S. EPA) On-Scene Coordinator, Remedial Project Manager, or other Regional Manager does not have procedures in place for IDW management.

These are standard (i.e., typically applicable) operating procedures which may be varied or changed as required, dependent upon site conditions, equipment limitations or limitations imposed by the procedure. In all instances, the ultimate procedures employed should be documented and associated with the final report.

Mention of trade names or commercial products does not constitute U.S. EPA endorsement or recommendation for use.

2.0 METHOD SUMMARY

Prior to site activities, the Task Leader should determine if the On-Scene Coordinator, Remedial Project Manager, or other Regional Manager has procedures in place for IDW management. This should be done by contacting the Work Assignment Manager.

If it is determined that procedures are not in place, then the Task Leader should evaluate IDW handling and management options based on:

- The site contaminants and their concentrations, and total projected volume of IDW.
- Media potentially affected (e.g., groundwater, soil) by management options.
- Location of the nearest population(s) and likelihood and/or degree of site access.
- Potential exposure to workers.
- Potential environmental impacts.

Every effort must be made to ensure the selection of investigation method(s) that minimize the generation of IDW, contact with contaminants, and cost of disposal. Efforts made to characterize IDW shall be consistent with the scope and purpose of the site investigation.

The QA Work Plan describing the anticipated approach and procedures for IDW management shall be clear, detailed, and concise. Any deviation or modification due to unexpected and unforeseen field conditions will be noted in the site logbook.

3.0 SAMPLE PRESERVATION, CONTAINERS, HANDLING AND STORAGE

This section is not applicable to this SOP.

4.0 INTERFERENCES AND POTENTIAL PROBLEMS

IDW can be contaminated with various hazardous substances. To handle IDW in compliance with regulations, reasonable efforts should be made to characterize the wastes.

5.0 EQUIPMENT/APPARATUS

Equipment, materials, and supplies needed for containerizing IDW are generally selected based on waste characteristics or constituents. Other considerations include the case of decontaminating or disposing of the equipment. Most equipment and supplies can be easily procured. For example, 5-gallon buckets, plastic bags, etc. can help segregate contaminated materials. Contaminated liquid can be stored temporarily in metal or plastic cans or drums.

5.1 Waste Disposal

- Trash bags
- Trash containers
- 55-gallon drums or 5-gallon pails
- Metal/plastic buckets/containers for storage and disposal of decontamination solutions

5.2 Decontamination Equipment

- Drop cloths of plastic or other suitable materials
- Large galvanized tubs
- Wash solutions
- Rinse solutions
- Long-handled, soft-bristled brushes
- Paper or cloth towels
- Metal or plastic cans or drums
- Soap or wash solution

6.0 REAGENTS

There are no reagents used in this procedure aside from decontamination solutions. In general, the following solvents are typically utilized for decontamination purposes:

- 10% nitric acid
- Acetone (pesticide grade)
- Hexane (pesticide grade)
- Methanol

7.0 PROCEDURES

7.1 Regulatory Background and Options for Management of IDW

This SOP is based on the following guidance document:

OERR Directive 9345.3-02, "Management of Investigation-Derived Wastes During Site Inspections," May 1991.

The guidance document presents a general regulatory background and options for management of IDW generated during Superfund site activities. IDW includes soil cuttings, drilling muds, purged groundwater, decontamination fluids (water and other fluids), disposable sampling equipment and disposable PPE. The National Contingency Plan (NCP) requires that management of IDW generated during site investigations complies with all applicable or relevant and appropriate requirements (ARARs) to the extent practicable. In addition, other legal and practical considerations may affect the handling of IDW.

IDW from site inspections may contain hazardous substances as defined by the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). Some CERCLA hazardous substances are hazardous wastes under Subtitle C of the Resource Conservation and Recovery Act (RCRA), while other substances are regulated by other federal laws such as the Safe Drinking Water Act (SDWA), Clean Air Act (CAA), Toxic Substances Control Act (TSCA), and the Clean Water Act (CWA). The U.S. EPA estimates that RCRA hazardous IDW have been generated at fewer than 15% of CERCLA sites. However, RCRA regulations, and in particular the RCRA Land Disposal Restrictions, are very important as potential ARARs since they regulate treatment, storage, and disposal of many of the most toxic and hazardous materials.

The U.S. EPA's strategy for managing RCRA hazardous IDW is based on:

- The NCP directive that site investigations comply with ARARs to the extent practicable.
- The area of contamination (AOC) unit concept.

The most important general elements of managing IDW are as follows:

- Leaving a site in no worse condition than existed prior to the investigation.
- Removing those wastes that pose an immediate threat to human health or the environment.
- Leaving on site those wastes that do not require off-site disposal or long-term above-ground containerization.
- Complying with federal and state ARARs to the extent practicable.
- Planning and coordination for IDW management.
- Minimizing the quantity of wastes generated.

The specific elements of the approach are as follows:

- Characterizing IDW through the use of existing information (manifests, Material Safety Data Sheets, previous test results, knowledge of the waste generation process, and other relevant records) and best professional judgement.
- Delineating an AOC unit for leaving RCRA hazardous soil cuttings within the unit.
- Containerizing and disposing of RCRA hazardous groundwater, decontamination fluids, PPE, and disposable sampling equipment (if generated in excess of 100 kg/month) at RCRA Subtitle C facilities.
- Leaving on site RCRA nonhazardous soil cuttings, groundwater, and decontamination fluids preferably without containerization and testing.

The U.S. EPA does not recommend the removal of wastes from all sites and, in particular, from those sites where IDW does not pose any immediate threat to human health or the environment.

Based on this information and the guidelines included in the following sections, the REAC Task Leader should include a plan for handling IDW in the QA Work Plan. Any deviations from or modifications to the plan due to unexpected or unforeseen field conditions must be noted in the site logbook.

7.2 Identification of IDW

To handle IDW properly, the Task Leader must know whether it contains CERCLA hazardous substances and whether these substances are RCRA hazardous wastes or contaminants regulated under other statutes. To handle IDW in compliance with regulations, reasonable efforts should be made to characterize them. However, these efforts should be consistent with the scope and purpose of the site investigation.

In particular, extensive testing is not warranted in most cases; instead, the nature of the wastes should be assessed by applying professional judgement, using readily available information about the site (such as manifests, storage reports, preliminary assessments, and results of earlier studies), as well as direct observation of the wastes for discoloration, odor, or other indicators of contamination. Similarly, RCRA procedures for determining whether a waste exhibits RCRA hazardous characteristics do not require testing if the decision can be made by applying knowledge of the

characteristic in light of the materials or process used. In most instances, a determination may be made based on available information and professional judgement. This does not mean that IDW can be assumed to be nonhazardous unless clearly proven otherwise. Given the limited information available, the Task Leader, in conjunction with the Work Assignment Manager, must determine whether it more likely than not that the wastes are hazardous.

Even if the IDW do not contain RCRA hazardous waste, the Task Leader should determine whether they contain other CERCLA hazardous substances. CERCLA hazardous substances include, in addition to RCRA hazardous wastes, substances, elements, compounds, solutions, or mixtures designated as hazardous or toxic under CERCLA itself or under the authority of other laws such as TSCA, CWA, CAA, and SDWA. Therefore, even if RCRA is not applicable, one of these statutes may be.

IDW may include, but is not limited to, the following items:

Solid Waste

- Soil
- Sediment
- Sludge/slag
- Drum solids
- Drill cuttings
- Used glassware
- Dedicated/expendable equipment (bailers, fitters, hose, buckets, XRF cups, etc.)
- Biological tissue
- Clean trash
- PPE
- Decontamination equipment (buckets, brushes, clothing, tools, etc.)
- Field analytics waste (immunoassay, chlor-n-oil, chlor-in-soil, HACH kits, sample extracts, etc.)

Aqueous Waste

- Drilling fluids
- Purge water
- Development water
- Decontamination fluids

7.3 Management of IDW

7.3.1 Waste Minimization

The Task Leader should select site investigation methods that minimize the generation of IDW, particularly RCRA hazardous wastes. The site investigation team should limit contact

with contaminants and use drilling and decontamination methods (such as steam cleaning) that minimize PPE, disposable equipment, decontamination fluids, and soil cuttings. In particular, the inspection team should minimize the amounts of solvents used for decontamination or eliminate solvents altogether. Minimizing the amount of wastes generated reduces the number of IDW handling problems and costs of disposal.

7.3.2 Types, Hazards, and Quantities of IDW

To handle IDW properly, the Task Leader must determine the types (such as soil cuttings, groundwater, decontamination fluids, PPE, or disposable equipment), characteristics (whether RCRA hazardous or containing other CERCLA hazardous substances), and quantities of anticipated wastes. As discussed previously, testing will generally not be required to characterize waste.

Upon determining the types of anticipated IDW, the Task Leader should determine IDW characteristics, in particular whether it is expected to be RCRA hazardous or to contain high concentrations of PCBs. For RCRA hazardous IDW, the Task Leader should determine whether it poses an increased hazard to human health and the environment relative to conditions that existed prior to the site investigation. Field analytical screening results, if available, may be helpful indicators of IDW characteristics. However, the Task Leader must remember that these are not RCRA tests and that the test results usually do not identify RCRA hazardous wastes. The Task Leader must also determine the exact properties of RCRA nonhazardous IDW to select an appropriate disposal facility when the off-site disposal is required.

Upon determining the type and characteristics of IDW to be generated, the Task Leader must assess the anticipated quantities of waste. This should be done based on past experience with site investigations of similar scope.

7.3.3 On-Site IDW Handling Options

In planning the scope of work, the Task Leader must decide if IDW can be left on site or if it must be disposed off site.

Handling of RCRA hazardous IDW and IDW with high PCB concentrations (greater than 50 ppm) may involve either moving the IDW within an AOC unit, or containerization, storage, testing, treatment, and off-site disposal. Handling of RCRA nonhazardous IDW usually involves various methods of on-site disposal. It is preferable to leave both RCRA hazardous and nonhazardous IDW on site whenever it complies with regulations and does not pose any immediate threat to human health and the environment.

If IDW are RCRA nonhazardous soil or water, they should be left on site unless other circumstances, such as state ARARs or a high probability of serious community concerns, require off-site disposal. RCRA hazardous soil also may be left on site within an AOC unit.

The Task Leader must determine procedures for handling IDW on site in conjunction with the Work Assignment Manager.

The on-site handling options available to the Task Leader when IDW are RCRA nonhazardous are listed below.

For soil cuttings:

1. Spread around the well.
2. Put back into the boring.
3. Put into a pit within the AOC.
4. Dispose of at the site's operating treatment/disposal unit (TDU).

For groundwater:

1. Pour onto ground next to well to allow infiltration.
2. Dispose of at the site's TDU.

For decontamination fluids:

1. Pour onto ground (from containers) to allow infiltration.
2. Dispose of at the site's TDU.

For decontaminated PPE and disposable equipment:

1. Double bag and deposit in the site or U.S. EPA dumpster, or in any municipal landfill.
2. Dispose of at the site's TDU.

If IDW are considered RCRA nonhazardous due to lack of information on the waste hazard, the Task Leader should have an alternate plan for handling IDW if field conditions indicate that these wastes are hazardous. In such a case, there should be an adequate number of containers available for collecting groundwater, decontamination water, soil cuttings, etc.

If IDW consists of RCRA hazardous soils that pose no immediate threat to human health and the environment, the Task Leader should plan on leaving it on site within a delineated AOC unit. However, the Task Leader must consider the proximity of residents and workers in the surrounding area and use best professional judgement to make these decisions. Planning for leaving RCRA hazardous waste on site involves:

- Delineating the AOC unit.
- Determining pit locations close to the borings within the AOC unit for waste burial.
- Covering hazardous IDW in the pits with surficial soil.
- Not containerizing and testing wastes designated to be left on site.

Another alternative for handling RCRA hazardous soil is disposal in a TDU located on the same property as the AOC under investigation. If the TDU is outside the AOC, it must comply with the off-site policy. If any decontamination fluids are generated which are RCRA hazardous wastes, they should be disposed of off site in compliance with the off-site policy or in compliance with the conditionally exempt small quantity generator exemption. Small quantities (i.e., no more than 100 kg/month) of decontamination fluids may be containerized prior to delivery to a hazardous waste facility.

7.3.4 Off-Site Disposal of IDW Options

IDW should be disposed of off site in the following situations:

- When they are RCRA hazardous water.
- When they are RCRA hazardous soil that may pose a substantial risk if left at the site.
- When they are RCRA hazardous PPE and disposable equipment.
- If leaving them on site would create increased risks at the site.

RCRA nonhazardous wastes could be disposed of off-site at appropriate RCRA nonhazardous facilities that are in compliance with CERCLA section 121(d)(3) and off-site policy when it is necessary to comply with legally enforceable requirements such as state ARARs that preclude on-site disposal. IDW designated for off-site disposal must be properly containerized, tested, and stored before pick up and disposal. Decontaminated PPE and disposable equipment should be double-bagged if sent to an off-site dumpster or municipal landfill.

Planning for off-site disposal should include the following guidelines:

- Informing the Work Assignment Manager that containerized IDW may be temporarily stored on site while awaiting pick up for off-site disposal.
- Initiating the procurement process for IDW testing, pick up and disposal.
- Coordinating IDW testing and pick-up activities.
- Preparing adequate numbers and types of containers. Drums should be used for collecting small amounts of IDW. Larger amounts of soil and water can be contained in Baker tanks, poly tanks, and bins. PPE and disposable equipment should be double-bagged for disposal at a municipal landfill or collected in drums for disposal at a hazardous waste facility.
- Designating a storage area (either within the site's existing storage facility, existing fenced area, or within a temporary fence constructed for the site investigation). No humans, children in particular, may have access to the storage area.

All IDW shipped off site, whether RCRA hazardous or not, must go to facilities that comply with the RCRA disposal policy, and the Task Leader, in conjunction with the REAC Purchasing Department, must verify that the facilities operate in accordance with this policy.

8.0 CALCULATIONS

This section is not applicable to this SOP.

9.0 QUALITY ASSURANCE/QUALITY CONTROL

There are no specific quality assurance activities which apply to the implementation of these procedures. However all IDW disposal information must be documented within site logbooks. Additionally, all shipping and transport of hazardous and nonhazardous samples will comply with Department of Transportation (DOT) and International Air Transport Association (IATA) regulations. For additional information regarding sample handling procedures refer to ERT/REAC SOP #2003, Sample Storage, Preservation, and Handling.

10.0 DATA VALIDATION

This section is not applicable to this SOP.

11.0 HEALTH AND SAFETY

When working with potentially hazardous materials, follow U.S. EPA, OSHA and corporate health and safety procedures.

12.0 REFERENCES

U.S. EPA, Guide to Management of Investigation Derived Wastes, OERR Directive 9345.3.03FS, January 1992.

U.S. EPA, Management of Investigations - Derived Wastes During Site Inspections, OERR Directive 9345.3-02, May 1991.

Code of Federal Regulations (CFR), Title 40, Part 261, Section 23, Section 11 (a) (3), and Section 24 (a) (b).

CFR Proposed Criteria: 51 FR 21685, June 30,1986 and 51 FR 21450, May 20, 1992.